Dr.M.H.M.G.N.H. Library
635.9 PAT
1199

1199
635.9 PAT

Sud
7.9.40

J1b N40

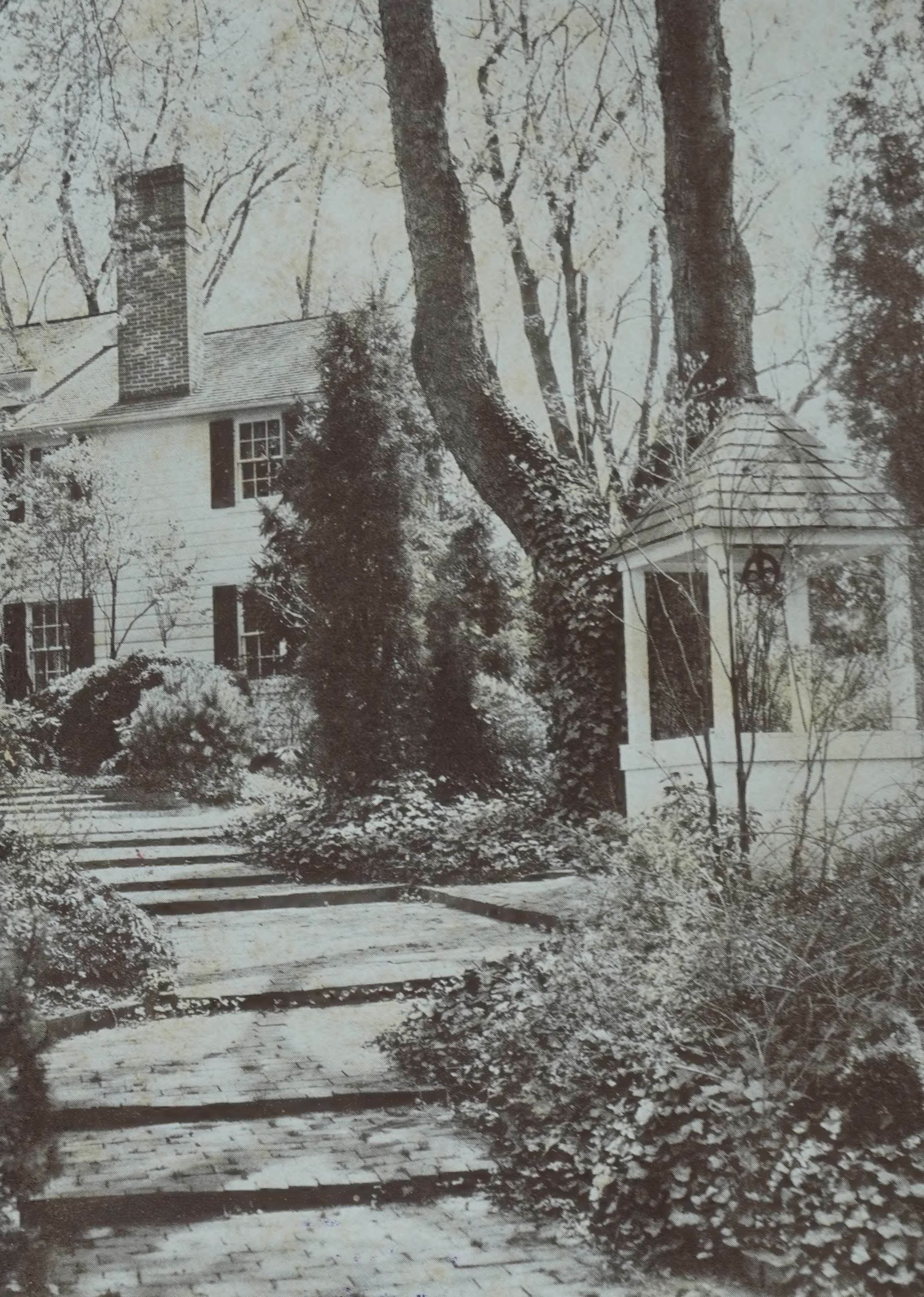
N40

ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಭಾಗ್, ಬೆಂಗಳೂರು

GOVERNMENT BOTANIC GARDENS,
LAL-BAGH, BANGALORE.
LIBRARY.
Section..........
No. ~~368~~
Date..........

ಡಾ|| ಎಂ.ಎಚ್. ಮರಿಗೌಡ ರಾಷ್ಟ್ರೀಯ ತೋಟಗಾರಿಕೆ ಗ್ರಂಥಾಲಯ * ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು *
ACC No. 1080

Be Your Own Gardener



Courtesy Baltimore Eveni

Unusually interesting low brick steps lead to a Williamsburg well-head in the Baltimore garden of Mr. and Mrs. Auville Eager.

635.9 PAT
1199

Be Your Own Gardener

How to Make, Maintain, and Find Satisfaction in Intimate Flower Gardens

By

STERLING PATTERSON

Government of Karnataka
Dr. M. H. Marigowda National Horticulture Library
Directorate Of Horticulture Lalbagh,
Bangalore - 560 004
ACC. No. 1199
CALL No. 635.9 PAT

HARPER & BROTHERS *Publishers*
New York *and* London
1940

GOVT BOTANIC GARDENS
LALBAGH BANGALORE
LIBRARY
No ~~368~~ Date ~~11. 9. 40~~

1080

635
PAT

ACC NO 1199

BE YOUR OWN GARDENER

Copyright, 1940, by Sterling Patterson

Printed in the United States of America

All rights in this book are reserved.
No part of the book may be reproduced in any
manner whatsoever without written permission.

For information address
Harper & Brothers

2-0

FIRST EDITION

A-P

GOVT [illegible] NIC GARDENS
LAL [illegible] NGALORE.
[illegible] RY
No ~~368~~

Dedicated to

FRANK McDONOUGH

In appreciation not only of the
quality of his friendship but of
the contribution he is making to
civilized living

CONTENTS

OPEN LETTER TO A FRIEND

I BEGIN AT THE BEGINNING: 5

Why a Garden Plan Should Be Made; Floriculture *vs.* Landscape Horticulture; Site Limitations; How to Make a Plan; The Functional Subdivisions—Entrance, Service, Propagation, and Private—and How to Unify Them; Summary.

II THE OUTDOOR LIVING ROOM: 39

Some High Lights in History; The Trend Toward Small Personal Gardens; Questions of Exposure; Pictorial and Practical Value of Shade; Lawn Trees—Good and Bad; Intrinsic Plant Character; How to Avoid Common Errors in Completing the Living Picture; Summary.

III HOW TO CREATE GOOD GARDEN LOAM: 70

The Urge to Dig Is Justified; What Soil Is; How to Condition Soils for Best Results;

Trenching or Double-digging; What is Meant by Acid or Alkaline Soil; Routine Cultivation and Feeding; The Value of Compost and How to Make It; Spent Mushroom Soil; Summary.

IV THE CARE AND FEEDING OF LAWNS: 103

The Ten Commandments for Good Lawns; How and When to Make a New Lawn; How to Remake an Old One; How to Maintain and Improve It; Differences Between Bent and Bluegrass; Shady Lawns and Ground Covers; Summary.

V THE MIXED FLOWER BORDER: 129

An Opportunity for Many Plants in Relatively Small Space; Use of Annuals in Conjunction with Perennials; Planning Detail around a Backbone of Hardy Stand-bys; Importance of Background—Masonry; Wooden; Hedges; Shrubs and Flowering Trees, with List of Sometimes Overlooked Desirable Subjects; How to Prevent Monotony in Hedges; Edgings; A Word or Two on Color Schemes; Summary.

VI THE SOLACE OF PERENNIALS: 175

What They Are and How to Keep Them Happy; How and When to Divide and Transplant; How to Increase Stock from Seeds or Cuttings; Advantages of Named

Varieties with an Explanatory Word on Botanical Nomenclature; The Big Five—Iris, Peony, Phlox, Aster, Chrysanthemum; A List of Other Superior Sorts, Their Virtues and Their Vices; Vines; Summary.

VII HOW TO MAKE THE MOST OF ANNUALS: 230

What They Are and Why They Are Needed; To Raise a Great Many Is Burdensome; Practical Means of Acquiring Annuals in Quantity for Combination with Perennials; Bedding Annuals in Modern Style; A List of Varieties Especially Useful in the Mixed Border, Arranged by Colors; Summary.

VIII DAFFODILS AND OTHER BULBS: 244

The Practically Perfect Flower; How Narcissus Is Classified and How a Representative Collection May be Started; Tulips, Hyacinths, Crocuses and Minor Bulbs; Lilies, Queens of Late Summer; How to Naturalize Bulbs; Opportunities for Bulbs in the Mixed Border; Summary.

IX EVERGREENS ON THE SMALL PLACE: 271

What We Mean by Evergreens; How and When to Move Them; How and When to Prune; Typical Problems They May Help to Solve; Certain Species and Varieties of

Evergreen Shrubs Especially Useful in the Small Garden; Summary.

X POOLS AND ROCK WORK: 289
The Besetting Sin of Incongruity; Architectural Integrity in Pools, Rock Work, Teahouses and Other Features; How to Determine the Type of Pool Required; Dangers of Amateur Rock Gardens; Wall Gardens and Pocket Planting; Summary.

XI GARDEN EQUIPMENT: 305
How to Save Time with Modern Tools; A List of Good Tools and Accessories; Fundamentals of Winter Protection; Control of Insects and Diseases; The Gardener's Five-Foot Shelf.

XII GARDEN CALENDAR: 319
What To Do and When To Do It—A Chronological Sequence.

INDEX AND GLOSSARY 341

ILLUSTRATIONS

Low Brick Steps Leading to a Well-head *Frontispiece*
Evergreens Add Accent and Contrast to the Small Garden *Facing Page* 50
An Apple Tree Banked with Tulip and Narcissus Beds ” ” 51
An Entire Garden in a Border ” ” 130
A Simple Place Demands Simple Planting ” ” 131
Apple Trees Do Well in Turf, Giving Shade, Blossoms and Fruit ” ” 194
An Unbroken Lawn Creates a Sense of Spaciousness *Following Page* 194
A Lily Pool in a Western Exposure *Facing Page* 195
A Formal Sunken Garden with a Flower-ringed Pool ” ” 258
New Planting for a Remodeled Farmhouse ” ” 259

CHARTS

How to Make a Garden Plan, Progressive Charts *Pages* 30–33
Cross-section of an Ideal Outdoor Flower Bed *Page* 80
Steps in Trenching ” 88
Basic Step in a Border Plan ” 141
Simplified Color Wheel ” 172

Be Your Own
Gardener

OPEN LETTER TO A FRIEND

Dear Fellow-gardener:

You've bought this book, presumably, because you trust the publisher (which is a good reason) or because you've read something of mine which encourages you to suppose my experience may be of benefit to you (which is a good reason, too, I hope) or because you're taken with the title or the color of the jacket or with somebody's review. Maybe, as I prefer to believe, you acquired it not only because you have access to land but because you're a mentally alive person as well. Unintelligent gardeners—some of them good growers, just the same—don't buy garden books, or they buy them and don't read them. The alert ones read. They know the printed word may contribute to better understanding of the changing art of garden making; and that the stimulus of a fresh viewpoint may result in increased personal satisfaction in the practice of the art.

Yet it isn't altogether surprising that small place owners, as a class, should have constituted in the past a relatively small market for garden books. So few have been written with any appreciation of environment. There are available splendid books for the possessors of plump purses and broad lands, excellent books devoted to certain phases of the garden or certain classes of plant material, superb books—like Taylor's *Garden Dictionary* and Seymour's *The Garden Encyclopedia* and Bailey's *Standard Cyclopedia of Horticulture*—for those whose education is sufficiently advanced to enable them to make use of such tomes. But rare indeed is the volume of specific value to the small homeowner, anxious to enhance by means of a little garden in good taste the attractiveness of his modest property.

Hundreds of thousands of Americans live, move, and mow their lawns in compact communities, satellites of the city. They are compromises, these commuting centers. They offer the companionship of the town, without crowding; the sweet breath of the country, without loneliness. Their inhabitants think in terms of lots, not acres; of fifty-foot hedges, not wooded hills; of single outdoor living rooms, not a series of seasonal gardens. If landscaping is to be done, to a marked degree the individual household, rather than a hired professional, does it. Nevertheless, no group in our population is more awake to beauty, more aware of the human need for it, or more willing to spend itself in an effort to achieve it.

For such, *Be Your Own Gardener* is submitted as guide, philosopher and friend. Founded upon no nebulous theory, stemming instead from twenty years of firsthand experimentation, observation and study, this book aims to be of genuine help to the gardener in applying tested principles to the fashioning and maintenance of intimate flower gardens, primarily personally conducted. Satisfaction in results, rather than mere methods of flower growing, has been stressed.

In twelve chapters, as brief as clarity and pertinence permit, are presented the basic problems of garden making on a small scale; and along with the problems are suggested varied solutions or principles leading to solutions. Since the book deals with principles and therefore may be called upon to function as a reference book, a careful index has been included as well as a recapitulation at the end of most chapters—designed for those who run as they read.

In brief, this book—confined to one branch of the horticultural art—is written not in ink but in a distillate of sweat and fun and heartache and hope wrung from bygone gardens. Its counterpart might have saved me much wasted labor and many disappointments, when I dug my first border years ago. I shall be chagrined, should it do less for you. The compliment of your purchase, in any event, commits publisher and author to live up to the promise of the title. On that score, we've done our level best not to let you down.

S. P.

"Hawthorn Hill"
Baltimore, Maryland

CHAPTER I

BEGIN AT THE BEGINNING

Why a Garden Plan Should Be Made; Floriculture vs. Landscape Horticulture; Site Limitations; How to Make a Plan; The Functional Subdivisions—Entrance, Service, Propagation, and Private—and How to Unify Them; Summary.

Good gardens start with design. This statement may seem to you self-evident. If it does, you're more experienced than most flower lovers. The average small garden begins with plants rather than plans.

Such a procedure, as all garden makers in the fullness of time become convinced, places the cart before the horse. Few people would set out to build a house by piling up bricks and bags of cement before deciding upon the form into which their materials ultimately were to be worked. The very notion is fantastic, isn't it? Yet, nine times out of ten, plant materials will be acquired haphazardly, by purchase or by gift, minus even a hint of a planting scheme—a program equally hind-end-foremost.

Why this inverted method should obtain so frequently, however, isn't difficult to explain.

Interest in gardens, more often than not, grows out of necessity. Good gardeners aren't born. They're made; and made slowly.

A family buys a home. Usually, the plot is already graded and seeded. Probably half a dozen bargain evergreens huddle around the foundation. Even when land is purchased first and an architect engaged to design the house and direct its construction, grading and seeding are either stipulated in the contract or are rushed through, regardless of the time of year, in order to correct as quickly as possible the raw nakedness of a new lot. The mind of a new homeowner turns as unerringly to grass as does his wife's to curtains. In all likelihood, the family moves in to find itself face-to-face with ready-made problems of garden maintenance.

It has as yet no real garden. But before long the misplaced young Douglas Firs and Red Pines start reaching for the windows, and the grass takes on the aspect of a blighted wheat field. Something must be done. The husband at this point knows less of horticulture than he does of the Ming Dynasty, although he's beginning to pick up from some of the men at the office a pointer or two on lawns. One evening he drags home a lawn mower; and, along with it, a dozen tomato plants. (The seedstore salesman said anyone could raise *them*.) The grass gets its first trimming. And the landowner gets his; for the tomatoes, tucked into a soft spot five inches instead of five feet apart, soon strangle each other. Fired by this evidence that her husband is rapidly turning into an Outdoor Type, the wife rushes to the nearest nursery and buys herself what she calls a "Rhododendrum." In rubbish and lime-laden masonry drippings, she plants it; and wonders why the poor thing dies so quickly.

Ten years later, great improvement will be apparent in the property of this couple. Their lawn will be green and flourishing; their rhododendrons glossy and healthy; their tomatoes stalked like California redwoods. Thanks to the sweat of their brows, to poring over seed catalogs, to heeding the advice of garden-minded and more experienced neighbors, they will have stored up a fine fund of knowledge of those plant types with which they've been dealing. They'll have had fun doing it, too. Still, their pleasure would have been greatly multiplied, I submit, had they at the outset drawn up a basic planting scheme.

By setting out young nursery stock, the plan could have been completed within a few months—provided funds had been available. If not (a highly probable negative, for most people spend on their houses more than they expect to and have little left over for the grounds), the landscaping could have been carried out cautiously over a period of years, a section at a time. Lacking previous experience or professional guidance, the latter is preferable in most cases. Tyros who make haste slowly and thoughtfully have a way of ceasing to be tyros.

Interesting gardens, it must be admitted, have been developed by planless, trial-and-error methods once in a while; but it is an inefficient, roundabout approach to a goal. Those same gardens, moreover, might have been better gardens, had they been planned in advance. With a destination always in view, effort would have been given definite direction. Less fumbling would have occurred. Less time would have been spent in sterile activity. Less money would have been wasted. And —most gratifying of all considerations—the passage of the years would have left behind a more unified landscape picture.

If I've learned in more than two decades of gardening and garden making anything incontrovertible, it is this: To start with details invites future dissatisfaction.

Basic design to a garden is what a skeleton is to an animal. Everything depends upon it. The bone structure (the plan) must be well knit before one can expect greatest effectiveness from the material (plant details) with which it is clothed. In a planless garden, some parts inevitably tend to grow out of relation to other parts. The finished product, as a result, is almost certain not to hang together properly; in other words, to disintegrate. No matter how smooth the lawn nor how colorful the flower beds, absence of an overall plan, consolidating the various elements in a limited landscape, is disturbing. Good garden design, indeed, might very well be defined as a disposition of the parts which brings order, unity and beauty to the whole.

Note that word, *order.* Upon it belongs the emphasis. It is the key to better small gardens. And better small gardens are worth striving for, because (if for no other reasons) they produce for their owners increased values and increased enjoyment. This observation, incidentally, applies with equal force to the remodeling of an out-of-date garden or the fashioning of a brand-new one. A plan is helpful, always.

Beauty is elusive. The word conveys different meanings to different people. But *order* is simple. It is perfectly comprehended by those who know how to make the inside of a house inviting. No woman, certainly, ever felt herself unequal to the task of arranging attractively any room, from pantry to parlor. And yet—though the problems involved are quite similar, except that garden ones may be more elementary than those imposed by interior decoration—the same woman sometimes shrinks from undertaking to furnish her outdoor living room. She takes fright at the sound of "landscape design." She says it doesn't apply to small places, as though both parks and pocket handkerchiefs weren't subject to the same artistic laws. She shuts her eyes to the vision splendid. She closes her ears to inspiration. And camouflaging her fancied inadequacy, she professes a passion for Nature's gardens, by which she means hit-or-miss effects rather than artfully offhand ones. She might as well excuse the strange apparition of a pig in the parlor on the grounds of a dislike for formality, or refuse to sew up the seams of a tweed coat as a means of guaranteeing a casual impression.

We Americans are too much disposed to write landscape (or any other art) with a capital A, to whisper in its presence, to approach it on deferential tiptoe. Our hushed attitude is absurd. Art is all around us, like the air we breathe. It enters into the most ordinary accomplishments: the baking of a pie, the making of a bed, the setting of a table. Art is no fair-weather friend to be greeted with distant, party manners. It is, on the contrary, an everyday companion to be welcomed, so far as possible, on all occasions. In its gracious and manifold revelations, it eases a tense and over-mechanized civilization.

There's one further thing this hypothetical lady, who perhaps confuses art with artiness, might do well to remember. What pleases her now won't necessarily please her ten years from now, when she knows better. Like clothes or conveyances, fashions in garden plants change; but fundamentals in design have remained pretty much the same from generation to generation, from Epicurus, fabled inventor of the town garden, to our own Olmsted. Bad taste isn't a handicap to be heroically lived above, like a wasp-minded maiden aunt or some other family affliction. Once it's recognized, it's no longer tolerated. And bad taste *will* be recognized, never fear, when time and thought spent in gardens have sharpened the landowner's perceptivity.

Floriculture is one thing. Landscape horticulture is another. Homeowners sometimes confuse the two.

No one will quarrel with a person who raises flowers for the sake of flowers. Indeed, to specialize in certain types of plants, to collect and grow species and varieties until one becomes exceptionally well informed on a genus is an intellectual activity of high order. From such experimentation emerges authority, such as that of Edward Steichen, the artist-photographer, upon Delphinium; or Clarence Connell, originator of the red Iris, Dauntless, upon Iris; or Joel E. Spingarn of New York upon Clematis—to cite a few amateurs. Nor is there any harm, to be sure, in cultivating ordinary garden plants in heterogeneous beds, regardless of form, scale, balance, unity and similar considerations.

When the stage of mystified wonder at causing anything at all to flower has been passed, however, most present-day gardeners progress to a more imaginative avocation. They go in for garden making. The majority, wisely, attempt to create a picture, or a group of related pictures, framing and augmenting the house. Yet some do not shake off the delusion that flowers alone may create a garden. They can't, of course, any more than books alone can successfully decorate a library. By the very derivation of the word, a garden is an enclosed place; and flowers may or may not be one of several elements in the composition. The *whole* picture is the important thing. In the case of a small place, flowers—delightful though they are in themselves—should in most instances be no more than the final fillip needed to enliven and invigorate the canvas. No fear need be entertained that such floral restraint will permit the gardener to be blessed with a superabundance of leisure.

A professional landscape architect, presumably, would prevent the owner from being troubled by either floral satiety or floral starvation; and, when possible, one should be employed. A professional's plan would recommend flowers in the proportion best suited to the property in question, would suggest the means whereby the owner's individual ambitions might best be realized, would weigh objectively architecture, topography, exposures, the gardener's temperament and other matters influencing design. His trained mind would grasp opportunities the layman might miss. His skill, discrimination and familiarity with plant materials would not only make possible rapid progress but, in the long run, probably would save money, despite his fee. With his help, one could be sure of stepping off on the right foot.

Limited acquaintance with plant material is perhaps more of an obstacle to the amateur landscapist than absence of formalized instruction in the art of design. Intuitively, many persons possess a fair sense of design. Comparatively few, on the other hand, can recognize on sight more than a dozen or so trees and shrubs and not many more annuals and perennials, until they've gardened for a number of years. Yet such lack of knowledge should not retard initiative unduly, for any nurseryman can suggest numerous plants for varied purposes, when the planting stage is reached. As a matter of fact, it isn't what plants you use but where and how you use them that counts.

Inexperience is a drawback, admittedly. But it's not insurmountable. If the services of a professional landscape architect cannot be afforded, a well-designed garden may nevertheless be generated. The fact that an amateur is one who works for love doesn't necessarily mean he's a bungler. He may become extremely expert. Study can cure ignorance. Aided by books, magazine articles, friendly plantsmen, seed catalogs, flower shows and botanical gardens, any man or woman of average intelligence can lay out a decent new small garden or redesign an outmoded one.

BANGALORE
LIBRARY
No. ~~368~~ Date ~~11.9.66~~

Don't, simply because you're an amateur, shun professional methods. They're good methods, or they would long since have been discarded. Consider, first, main allocations of space. Try for pleasing masses. Keep your plan simple. Think ahead. Make allowance for at least ten years of growth. Talk, by all means, with friends whose gardens you admire. Observe the basic forms of exhibition gardens at flower shows. Take note of the shapes and masses of exciting gardens encountered on tours. Buy a set of Garden Building-Blox (Wayside Gardens, Mentor, Ohio) to help you with plant details, if you like. But don't worry too much, at the outset, about color or season of bloom or botanical names.

The hardest part of gardening is planning. Concentrate on it, and the rest is easy.

Put your plan on durable paper, such as a mounted drawing board. It will take a long time to turn your drafted scheme into reality. Again and again, for reference, you'll need the drawing. Without it, it's almost impossible to keep details in mind or to hold your perspective on the project as a whole. Your garden plan is a record of your mature garden of the future. In place of vague wishes, the drawn plan substitutes a definite program of work. And, more important still, *it is a constant spur toward accomplishment.*

In the creation of sound small gardens only five attributes are required: 1. Available land; 2. Willingness to study and to sweat; 3. Imagination; 4. Patience; 5. A little money. These are the miracle workers. If you have them, you can be sure of ultimately adding new charm to your neighborhood and of introducing into your own life, through your gardening, more happiness and greater satisfaction.

A little money, you'll note, is the fifth essential to successful gardening on a small place. The phrase is deliberately indefinite. No garden, obviously, can be constructed or operated entirely without expenditure. Even a single bed of zinnias demands a few dollars for seeds and fertilizers and tools. Yet to answer precisely the question of how much cash it takes to make and manage a small garden is well-nigh impossible, for cost is a factor more variable than April weather. By and large, the closest approximation to the truth would be that a garden costs what you have to spend on it.

Gardening expense divides itself into two categories: first, the making of the garden; second, its maintenance. Experience leads me to believe, while exceptions are numerous, an allowance equal to one-tenth the cost of the house is on an average adequate to cover grading, seeding of lawns, roadways, paths, and the establishment of a simple small flower garden. Annual maintenance, in turn, averages perhaps 10 per cent of that sum. In other words, for a $10,000 house one might reasonably expect to invest in landscaping $1,000; and, subsequently, to keep garden and grounds in shape at a rough cost of $100 a year.

Here's a specific instance: Following a professional plan, I at one time landscaped the grounds of a quarter-acre place, including a garden measuring 50′ x 110′, which contained around 100′ of 8-foot wide border, lawns, pool, trees, shrubs, flagstone terrace and paths, picket fencing and driveway, for something less than $1,500. The property was my own and I performed fully 90 per cent of the labor—a prodigious amount, though yielding unbelievable returns in contentment. Had I hired others to dig and haul for me, the price would have mounted perceptibly and the task would have been done sooner. As it was, the job consumed twelve years.

From April to November each year, I put in on the garden and grounds about sixteen hours a week. I never thought of it as work. For me, it was fun. I preferred it to golf, as any sensible person might who didn't have to play golf for business reasons. Still, sixteen hours a week for thirty weeks comes to 480 hours. Deduct eighty hours for hired labor and call it 400 hours a year for twelve years—why, that's 4800 hours, or 600 8-hour days. Half this was maintenance; half was the conquest of new territory. I never thought of it before, but I saved myself a fearful lot of money under the impression that I was merely enjoying myself. I had no idea I had been so thrifty!

Built and kept up at a rate of $125 a year, an item placing little strain upon the average householder's budget, the garden cited is an example of the greatest single benefit of advance planning: the creation, without unduly counting the cost, of the kind of garden the heart desires. Landscaping is advanced, step by step, as circumstances allow each forward stride to be taken. The plan supplies incentive. Patience and persistence contribute the remainder.

No two members of the human race are exactly alike. By the same token, no two gardens are, or should be, duplicates. All soundly conceived gardens, however, have in common certain characteristics; and from them may be compounded axioms of benefit to small gardens in particular.

I do not mean to postulate that familiarity with elementary design will insure incomparable gardens for everyone. Some people, naturally, are endowed with greater aptitude, ingenuity, or talent than others. But I do hold that a thoroughly planned garden will better an unplanned one, no matter who does the planning; and that some knowledge of art principles applied to the planning will not be amiss.

Design of small gardens does not exceed the grasp of the amateur. After all, they form a limited class. The lots most of us own are rarely wider than 100 feet, or deeper than 200 feet. The buildings on them occupy from one-third to one-half the total area. Most small gardens, consequently, are in close relation to dwellings. They are intimate, personal and, in my opinion, more important than the most magnificent show place ever devised. They are lived in and loved by their owners rather than dispassionately regulated by employees. They thus possess the priceless boon of individuality; and they may, despite restricted scope, be genuinely distinguished.

Boiled down to topographical fundamentals, building lots fall into two classifications. They're flat; or they're uneven. If level, primarily formal development is usually indicated. If rolling, informal landscaping with curving lines and asymmetrical balances is generally productive of best results. In either case, the porch or terrace by which transition from house to garden is made must be relatively formal. Due to proximity, it partakes too much of the nature of the house to be otherwise.

That's the nub of the whole business. To be sure, chances for error are many. They occur, however, chiefly in details—inappropriateness of plants and accessories, overplanting, monotony and such matters—and they shrink into comparative insignificance, provided basic design is meritorious. A really well-designed garden shows a pleasant face even in the dead of winter, when not a blossom distracts the onlooker. Such gardens aren't so rare as one might suppose. I happen to know one walled garden in Mill Neck, Long Island, so beautifully composed, so artfully balanced that its border could be planted to ragweed and purslane without confiscating the effectiveness of the garden as a whole. Isabella Pendleton Bowen was the landscape architect; Mrs. Huntington Babcock, the gifted daughter of Neltje Blanchan, is the garden's owner.

Corrections or alterations in detail are easily made. Such of them as are performed in bed and border, in point of fact, tend to sustain garden interest. But modifications in fundamental plan, especially after a lapse of years has enabled trees and shrubs to attain large size, are not so readily contrived. Although the basic design of a small garden should be neither too costly nor difficult of execution, it is the part of wisdom, before actual work commences, to settle upon one with which you can live in contentment for many years to come. Frequent drastic changes are to be avoided. They drain the purse and postpone capture of repose, that blessed concomitant of old gardens. In determining your overall plan, therefore, project yourself as much as possible into the future. Check the scheme's features not against the present but against an envisioned maturity—ten, twenty, thirty years from now. Ten years in the life of an established garden passes, curiously enough, with the suddenness of a summer shower.

House and garden should join, visually. Lack of optical union gives rise to subtle discontent. One might, I daresay, experience a like sensation were a room to intervene between library shelves and reading lamps. A preposterous mistake of this nature would interfere seriously with reading habits. Likewise, irrelevant space interposed between a house and its garden tends to diminish the garden's use. Access to the garden should be easy. Moreover, the eye should be led from the house out into the surrounding greenery, so that the outdoors will beckon the visitor. A garden which invites enjoyment will *be* enjoyed.

This tying together, or unification, of house and garden is accomplished by means of an imaginary line running from window, door, terrace, steps or something of the sort to a point of interest in the garden. The line is called the garden axis.

In formal developments, the axis always bisects the garden area. When one remembers that an axis is a line upon which a body theoretically may revolve, it becomes easy to recognize the need to balance the area on one side of the axis against the area on the opposite side. In a formal design, each side will balance the other both in shape and dimensions. The two sides, in short, will be almost twins. In an informal arrangement, one side of the axis may encompass a larger territory than the other. Equilibrium is then to be attained not through proportions but by setting one mass against another, or some other device which is not symmetrical. For example, extra width on one side of the axis may be balanced by a heavy group of shrubs on the other; or, a large tree form may be counterbalanced by the color of a long border.

In both formal and informal developments, however, the garden axis calls for a bold termination. A bench, a pool, a teahouse, a conspicuous tree should rivet attention and mark the line's end. All boundaries, in fact, should be indicated quite definitely. A garden must begin; and it must end. It is arbitrary, not natural. A meadow bright with flowers, though pleasant, is not a garden. Within a specifically limited space, a garden weds art with horticulture. It assembles grass, shrubs, trees, flowers, water and accessories and fashions out of them a picture—all confined within a frame. The picture may be as tight as a Holbein or as loose as a Boardman Robinson sketch; but it doesn't run off the canvas.

The garden axis may also be cut at right angles by another imaginary line, the cross-axis. In large gardens there may be several cross-axes. Only one, or none at all, is preferable in a small garden. Intersection of axis and cross-axis is a suitable, indeed almost necessary, point of accent. Yet its marker—sundial, figure, specimen shrub or what-have-you—should never exceed in value the terminal accent. In general, be chary of accents. It is safer to have too few than too many.

The form of the garden proper, in the main, is either rectangular, square, circular, oval or a combination of two, or more, of the four. For most purposes, the best of them is the rectangle. Next best is the square. The circle and the oval are tricky to design and difficult to maintain. Unless land contours permit of nothing else, they are better avoided by amateurs.

The rough shapes of the various divisions of your property are pretty permanently determined by boundary lines and the laying of paths and driveways. These should, consequently, be most carefully considered, whenever control over them is possible. You not only wish for definition but you want your roads and paths to be deliberate, purposeful, functional. They must lead to authentic destinations in a forthright manner rather than cast about in confusion, like a bird dog on a cold scent.

Does all this sound complicated? It isn't; though the terminology, if it be unfamiliar, may hint as much. In truth, the garden development of a small place is no more complex than the successful furnishing of a room. In one case, you deal with living things; in the other, with inanimate objects. In both, you attempt to conjure up comfortable and harmonious backgrounds for human beings. Really, the problems are parallel in many respects.

Of the mechanics of landscaping, we need include here no more than appears essential to clear understanding (with its attendant increase in capacity for enjoyment) of the function of the small garden. Our concern is chiefly with the making and maintenance of agreeable outdoor living rooms, a part—the most provocative division but none the less a part—of small place development. Should you be troubled, however, by such questions as how to lay a brick path, or how to construct a storm gutter, or how to estimate the size of your parking space, I can particularly recommend for consultation L. W. Ramsey's *Landscaping the Home Grounds.*

To plan garden and house together, to correlate them before even the first spadeful of earth has been removed, is what most of us would prefer. Books on landscaping usually advocate such procedure. In reality, few of us can follow this good advice, no matter how much we might wish to do so.

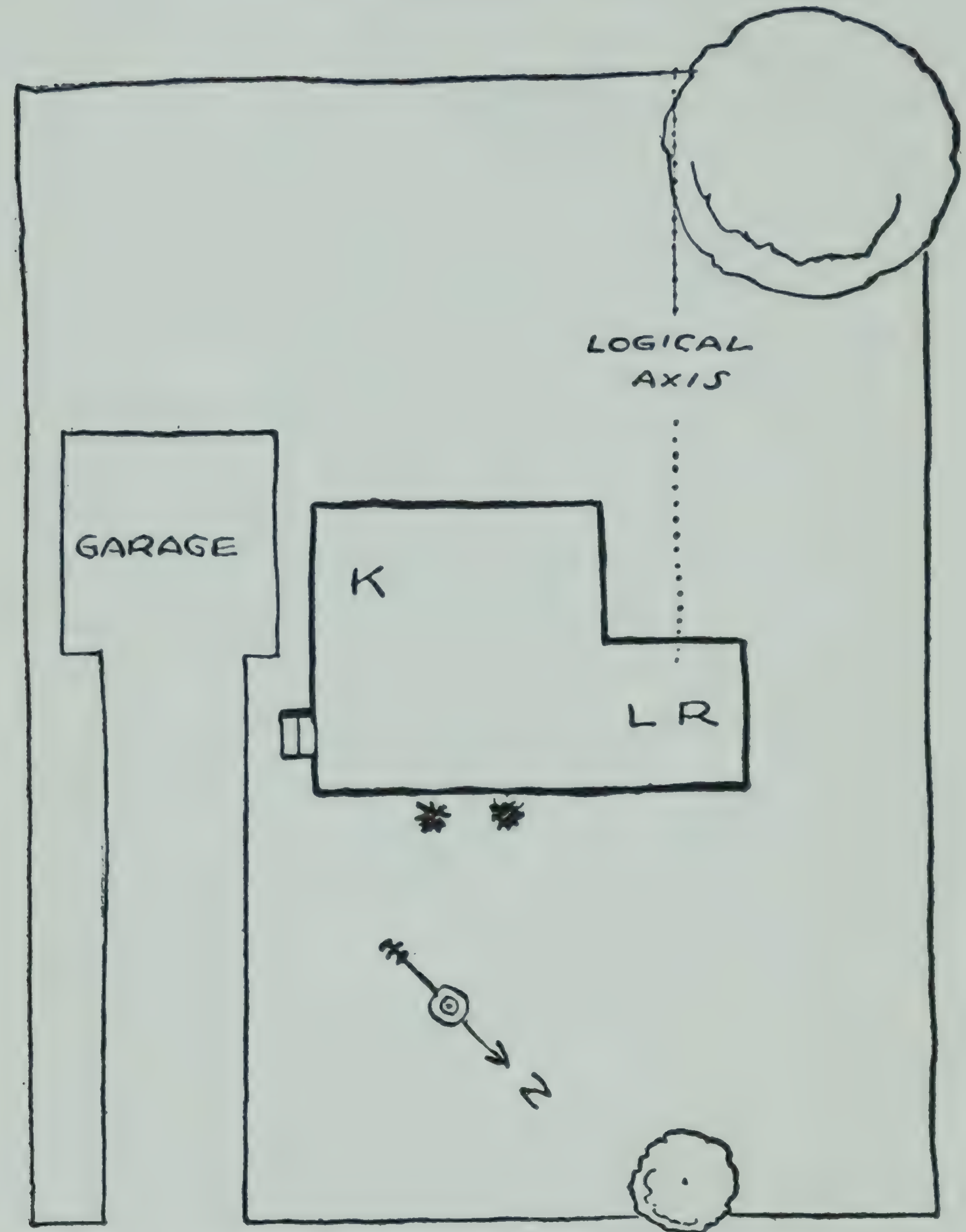
The dwellings we acquire are, as a rule, finished houses. Driveways and entrance path have been laid. The garage has been completed. The opportunity to specify the position of the house upon the lot has passed. We may be able to substitute a door for a window, or to make other minor alterations which will help to integrate house and garden. But we cannot turn the residence to the north when it already faces east, or push it closer to the street line in order to have more room for a garden at the back. We simply have to do the best we can under conditions actually existing. And, if we bring to bear upon limiting factors enough thought, we shall do surprisingly well.

Let's assume, now, that the family exchequer won't stand the strain of a professional's charge and that we are forced to map out our own scenic improvement. There are many ways of going about it, varying with individual temperament. Some would rush to the library to read up on the subject. Some would begin to make preliminary sketches. Some would visit the neighborhood's "best gardener" or their favorite nurseryman. If you happened to invite me into conference, I'd proceed along some such lines as these:

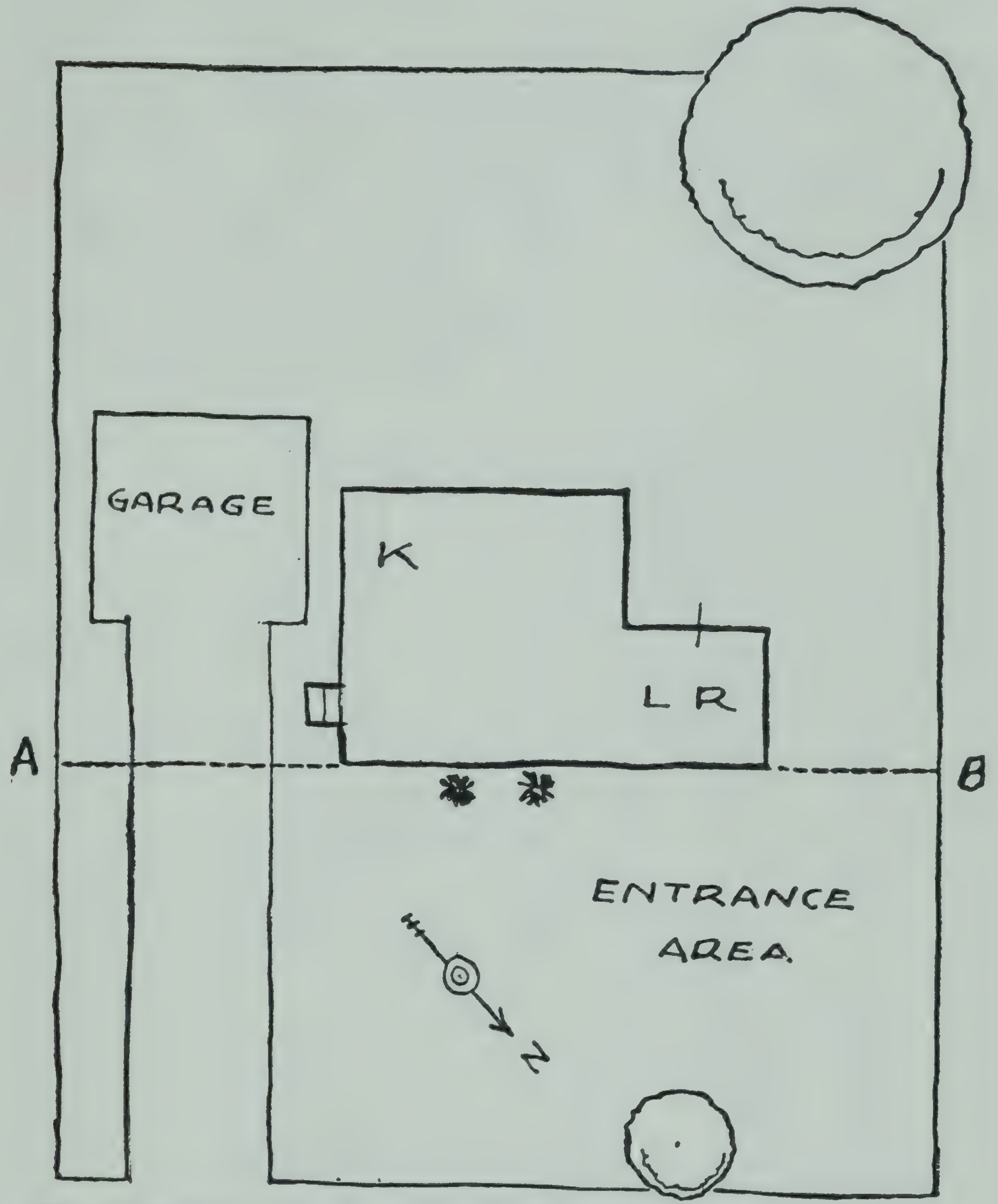
First, we'd stroll over the property to observe the lay of the land. We'd discuss the types of gardens you found appealing and the amount of money you proposed to spend, in the long run, on your own. We'd take note of fairly level sections of the lot, which might with least exertion be transformed into garden plots; of unlovely views, which should be screened out, and of striking ones which might be capitalized; of exposures, prevailing winds, soil conditions, existing plant life, and existing paths and buildings; and, finally, we'd make a special mental memorandum on the side of the house best suited to become the garden elevation and how, through existing or projected porch, terrace, window, door or steps, it might be tied in with a future outdoor living room. In other words, we'd collect pertinent landscape facts and we'd determine the main garden axis.

Next, we'd record these facts. We'd draw to scale on graph paper (which you can buy at any store selling draftsmen's supplies) a crude layout of the property, locating all existing trees, boulders, buildings, roads and other things difficult or impossible to move. And we'd indicate the garden axis.

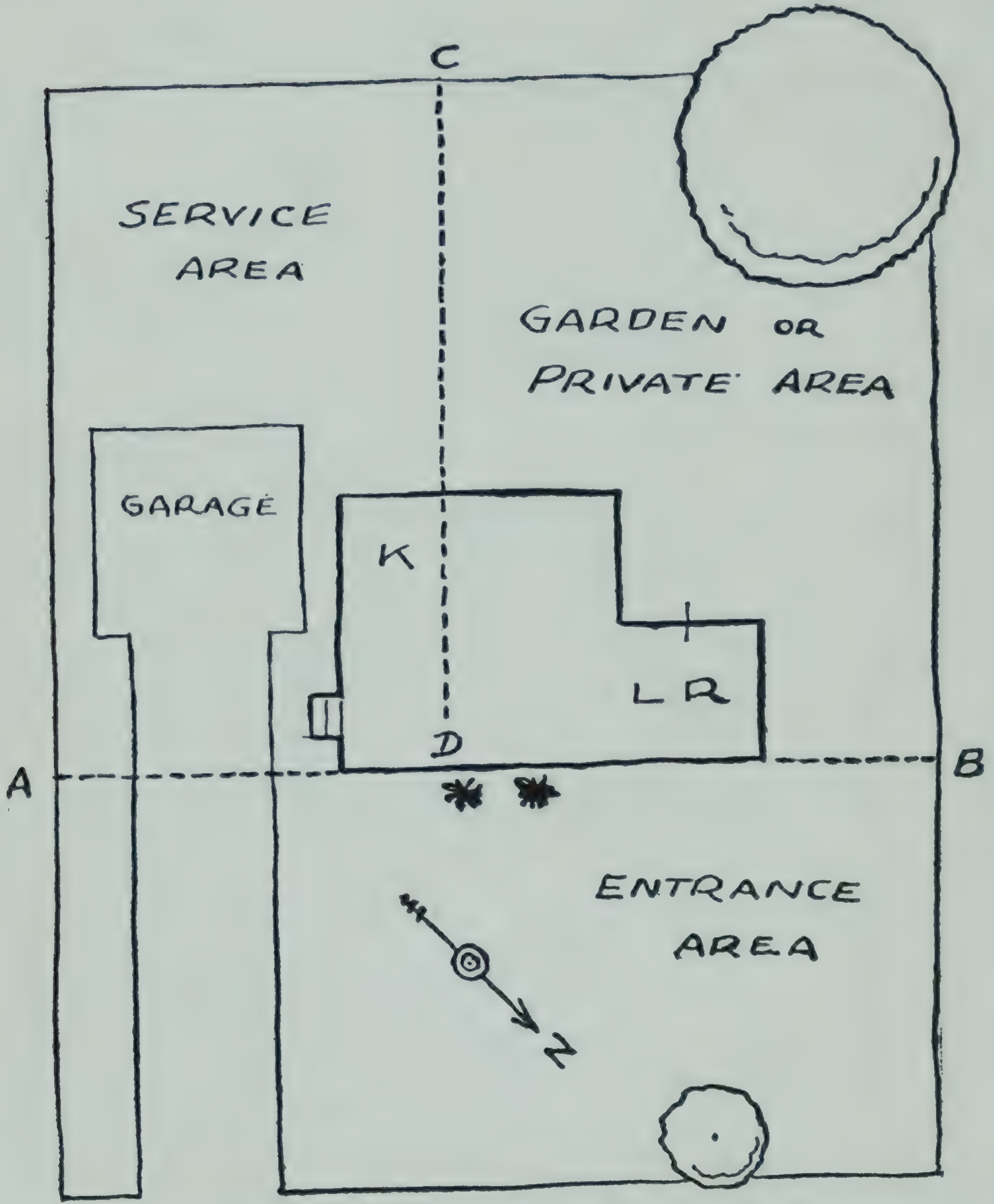
From this graphic representation, we work out the main allocations of space. There are three of them: 1. The Entrance Area; 2. The Service Area; 3. The Garden, or Private, Area. To my way of thinking, one more—placed either in the



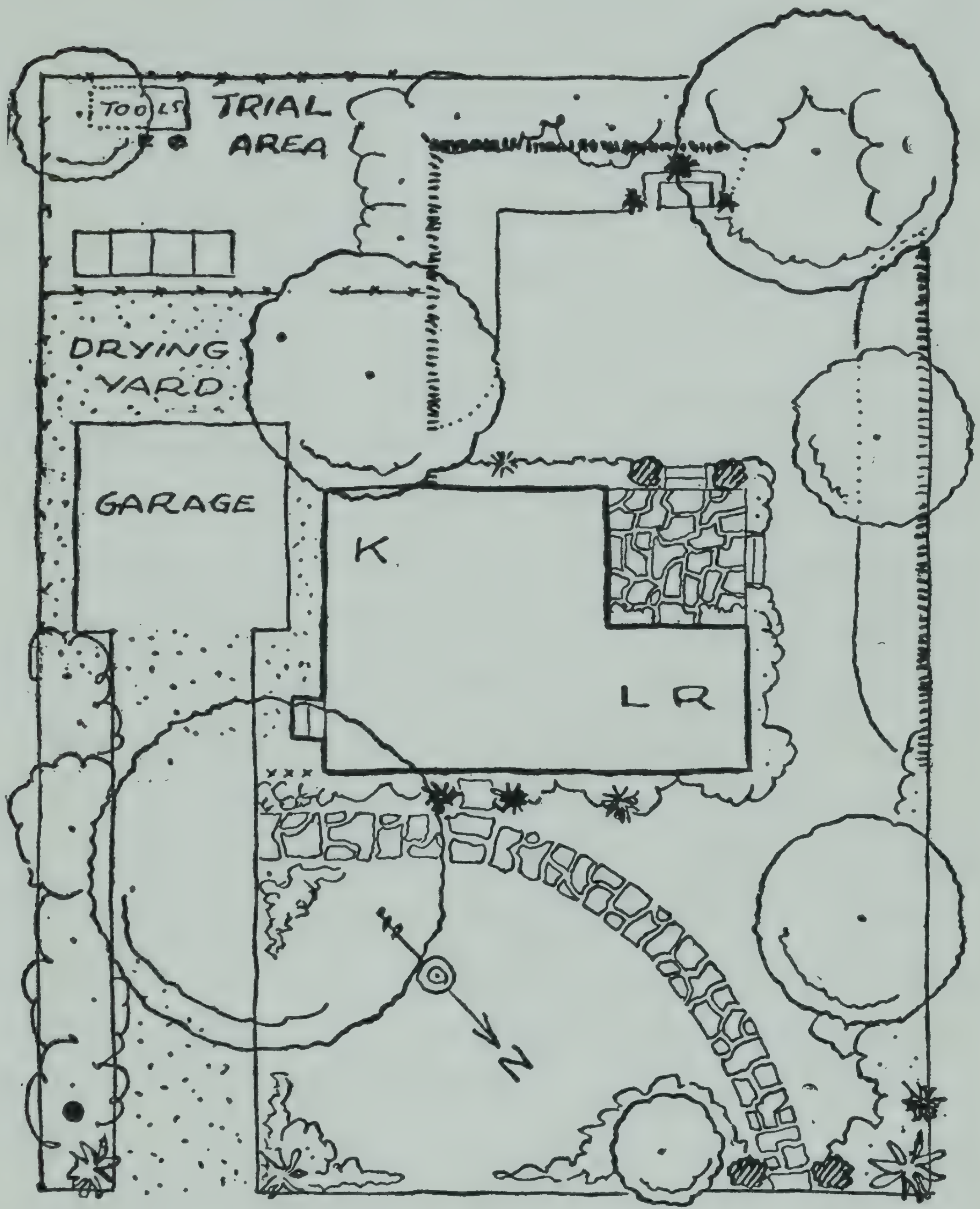
How to Make a Garden Plan—Step 1: Make scale notes of existing plants, roads, paths, buildings and determine best side of house for garden development. The use of plotting paper simplifies the task.



How to Make a Garden Plan—Step 2: Project the lines of the front of the house so as to mark off the Entrance Area.



How to Make a Garden Plan—Step 3: Project a line from the kitchen side of the house in order to establish the service area, which usually may include the Trial and Propagation Area as well. The remaining ground is the Garden, or Private, Area.



How to Make a Garden Plan—Step 4: Once functional areas have been allocated, it is easy to work out the form and character of garden and grounds and then to proceed to plant details.

Service or in the Garden Area—should be included: 4. The Trial and Propagation Area.

This fourth division may be comparatively small but, by reason of its convenience and the amount of pleasure it adds to garden work, it is important. In one spot (back of the garage, perhaps) you concentrate all those untidy jobs so stimulating to perform and so upsetting to the ordered composure of the garden proper. Here are your compost pits and your frames, your special seed beds and your flats, your outlandish collection of peach baskets and other shading devices, your burlap and raffia and labels. There'll be a supply of water, of course, and a chair in which the gardener can rest his weary bones for a moment without worrying about his mud-caked clothes. In such practical surroundings, how many mundane tasks reveal delightful aspects: seeding, rooting slips, raising flowers for cutting, experimenting with novelties before honoring them with places in your permanent garden. Your trial ground becomes as versatile as a safety pin! You'll miss a great deal, should you omit from your plan such a real gardener's haven. It is the school for green thumbs, the essence of garden art, your personal shrine to the goddess of growing things.

Not to digress further, glance at the drawings on pages 30 to 33 to see how simply the progression from landscape notes to basic garden plan is brought about.

1. Project the lines of the front of the house. The area lying between these lines and the street is the Entrance Area. It is what you show the public as it motors past your door. Nowadays, we don't rock on the front piazza and watch the carriages roll up the road. Neither do we completely shut out the passer-by. We are influenced, to be sure, by neighborhood practices and customs; but, in general, we leave open the center of the Entrance Area, plant its margins, and frame the residence with a tree or two. This marginal elaboration includes planting (but not overplanting) the base of the house so as to merge building and site gracefully. On occasion, it may embrace a dooryard flower garden. We are more likely, however, to use dwarf evergreens, relieved by bulbs, perennials and vines, for foundations, because of the slowness with which they grow out of scale and because of their year-round effectiveness.

2. Project the lines of the kitchen side of the house. The area lying between them and the boundary line is the Service Area. Except for that

part of it which can be seen from the street and therefore belongs as much to Entrance as to Service, it is purely functional. Here are garage, tool shed, drying yard, child's play yard, and other useful but none too decorative items. Hide them, when they should be hidden, with honest lattice, hedge or shrubbery. Don't hesitate to lay concrete paths in this territory. Concrete is not gardenesque but a laundry yard is no garden, either. Practicability is the stuff to give the troops in the Service Area.

3. The space left over after Entrance and Service Areas have been deducted is the Garden, or Private, Area. Some of it may be at one side of the house; most of it will probably be in back of the house, an advantage, often, in securing privacy. It may be large enough for two interrelated gardens, one a formal one perhaps; or it may be so small as to allow only a tiny lawn, surrounded by border and backed by hedge or fence or wall. If it is logically thought out, if it is in scale and integrated with the house, if it is secluded, orderly, diversified, it will be a real garden whatever its size. How it is planned depends upon the architectural character of the house, possibilities of the

site, personal preferences and ingenuity. But don't trust your memory. Put your ideas down on paper and look at them. Make sketches of various schemes and pick them to pieces. Show your trees and shrubs as full-grown, not the whips you'll actually plant. Examination of such sketches will help you to see your place whole, to avoid fussiness and overplanting, to keep it strong, simple and unified at maturity. Remember that you're interested in shapes, rather than actual plants, at this stage. Criticize and erase and substitute until, finally, you have a coherent scale drawing of your place as you want it to appear in, say, ten years.

Your hardest work then is done. Your dream has taken on substance. In place of spasmodic enthusiasms, you've evolved a workmanlike, integrated schedule. Ahead of you lie hope and sure attainment. You're on your way. Thanks to your landscape plan, you know where you're going.

Summary of Chapter I: *Design, the backbone of good gardens, is a disposition of the parts which brings order, beauty and unity to the whole.*

The effort demanded in making a landscape plan for a small place is well worth while, because *it tends to develop a properly integrated property; to decrease future dissatisfaction; to increase the owner's pleasure; and to add to real estate values.*

The creation of sound small gardens requires: 1. Available land; 2. Willingness to study and to sweat; 3. Imagination; 4. Patience; 5. A little money—perhaps, on an average, 10 per cent of the cost of the house. By spreading expenditures over a period of years, the type of garden most desired, if planned, can be built without undue financial strain.

Gardens should be different, but all good ones are likely to be: 1. Easy of access; 2. Definitely bounded; 3. Joined to the house by means of visual garden axis as well as by terrace, porch, or other transitional architectural feature; 4. Generally formal on level lots and informal on uneven ones; 5. In either case, planned on the same principles.

A physical survey collects landscape facts and determines the main garden axis. Transferred to graph paper, these facts are pondered; functional areas are allocated; and a logical, workmanlike project is evolved and recorded for guidance in the future. Now you are ready for details.

CHAPTER II

THE OUTDOOR LIVING ROOM

Some Highlights in History; The Trend Toward Small Personal Gardens; Questions of Exposure; Pictorial and Practical Value of Shade; Lawn Trees—Good and Bad; Intrinsic Plant Character; How to Avoid Common Errors in Completing the Living Picture; Summary.

A thoroughly successful small garden fits its owner's temperament as neatly as it does its site. For the individual, the best garden is the one calculated to make him happiest. To pronounce one style superior to others disregards this fact and thus savors not only of dogmatism but of arrogance. A garden book may hope to suggest. It cannot presume to dictate.

Each type of garden embraces its own singular and special appeal. The walled garden stresses quiet privacy. The geometric formal garden is crisp and dignified. The garden composed in the main of flower-and-shrub border surrounding open lawn is friendly, unassuming, easy to maintain. Theoretically, in settling upon your basic landscape plan you have already taken into consideration these distinguishing attributes and, in so far as seemed desirable, you have applied them to your particular terrain. The fashion you propose to follow in your own garden is likely to be—and should be—determined on a distinctly personal basis; for you certainly cannot be expected to learn to love a garden whose surface demeanor you dislike. At the same time, a rapid survey of signposts, pointing the modern trend toward simplification and seclusion, may prove illuminating.

American garden tradition has always been, and is now, predominantly English. While our budding art has responded to the impact of French, Italian and Spanish ideas (the last-named is especially perceptible in California today), the light of history reveals the reason for British ascendancy.

The first settlers on our eastern coast were English. They brought with them fixed garden customs. They were, themselves, practical gardeners, both by necessity and by choice. That a gardening philosophy which originated in the Atlantic seaboard colonies should have spread westward as our republic expanded is not surprising.

Again, our most persuasive early landscape specialists—men like Andrew Jackson Downing (1815-1852) and Frederick Law Olmsted, Senior (1822-1903)—were conspicuously attuned to the English spirit. And our amateurs, our garden makers, from before the turn of the century until a few years ago, were exposed, like our British cousins, to the potent and salutary flames ignited by two remarkable Britons, William Robinson and Miss Gertrude Jekyll.

William Robinson was, in effect, a one-man revolution. By publication in 1883 of *The English Flower Garden*—an extraordinary piece of work which ran through no less than fourteen editions—he became recognized as "the father of the hardy border." In this book, and consistently thereafter during his long life, Robinson advocated the principles of natural beauty and hurled violent philippics against knot and ribbon bedding and all manner of artificialities desecrating the English countryside. To many, it's astonishing to learn that the perennial border, as we now envision it, is a garden device but little more than fifty years old; and that staid England, as well as our own raw-boned young nation, suffered during the Awful Eighties from outbreaks of the Municipal, or Fire-house, School of Landscaping.

Miss Jekyll, a painter turned gardener toward the evening of her eighty-nine years, applied to landscape horticulture the high aesthetic standards of a scrupulous artist. Her death in 1932 silenced a voice which, first heard in 1908 in the pages of *Colour in the Flower Garden*, had pleaded passionately for a more discriminating approach to garden making. Listen to a quotation:

> Merely having plants or having them planted unassorted in garden spaces, is only like having a box of paints from the best colourman; or, to go one step farther, it is like having portions of these paints set out upon a palette. This does not constitute a picture; and it seems to me that the duty we owe to our gardens and to our own bettering of our gardens is so to use the plants that they shall form beautiful pictures; and that, while delighting our eyes, they should

be always training those eyes to a more exalted criticism; to a state of mind and artistic conscience that will not tolerate bad or careless combination or any sort of misuse of plants, but in which it becomes a point of honour to be always striving for the best . . .
It is just in the way it is done that lies the whole difference between commonplace gardening and gardening that may rightly claim to rank as a fine art.

The professional plantsmen, the specialists and geneticists and collectors, shared mightily, of course, in the rebirth of intelligent gardening on both sides of the Atlantic. Still more nowadays are they inspiring garden makers; for garden results, quite logically, are immeasurably affected by the varieties and species easily available. The landscape schools, the professional practitioners, the garden clubs, the horticultural societies, the botanical gardens, the agricultural experiment stations, the great exhibitions—such as the Chelsea and Antwerp and New York and Boston and Philadelphia shows—the publishers and teachers and articulate enthusiasts, the better commercial catalogs, and even those mute, inglorious, neighborhood Miltons whose examples fanned the embers of local floral ambition—all have contributed to garden art. I would belittle the educational stimulus of none. Yet it is not an overstatement to say that William Robinson and Gertrude Jekyll played a major part in shaping the prevailing gardening creed of the English-speaking world.

Like fresh air let into a dusty, stagnant attic, these two talented people swept upon the scene, blasting smugness and complacency and dullness before them. And because they gave impetus to an unostentatious form of gardening, packed with immense possibilities for personal enjoyment, we who dream gardens and plant them and tend them and love them today must be forever grateful.

Today's attitude is epitomized by the frequency with which the small garden in America is referred to as an outdoor living room.

The phrase admits of wholesome connotation; for "outdoor living room" implies an extension of the house in which the whole family, from Grandma to Junior, works and plays in harmony. The analogy between it and a soothing gathering place inside is readily detailed. A grass panel or, if the garden be modeled after the Victorian parlor, a pattern of paths and beds is the floor covering; terrace and benches and pool and shade trees are equivalent to sofas and chairs and tables; shrubbery or hedges or fences are the walls, and flower borders are colorful pictures hung upon them; vistas are the windows and the blue dome of the sky is the ceiling. To think of a small garden in terms of habitation, indeed, is of practical assistance in carrying out appropriate planting.

The most significant change in gardens in recent years is the elimination of the front porch and the transfer of the garden area, accompanied by porch or terrace or both, to the side or back of the house. There are exceptions to the practice, to be sure. The dooryard garden for a New England or, more specifically, a Cape Cod type of home is backed by historical precedent and still rates expert approval. But, by and large, owners of small properties make a very definite effort nowadays to obtain garden privacy. This seems to me to have but one interpretation: the growth of a bona fide and deep-rooted interest in personal, rather than vicarious, gardening—a sign, in turn, that American gardening is coming of age.

Don't be stopped from making a garden in a spot, which seems to you fitting and convenient, simply because its exposure is not the most favorable. Eastern and southern exposures allow the greatest latitude in plant material. That's true. But a sound small garden can be worked out in any exposure—north, east, south or west.

Small gardens in general are rectangular projections in which an elevation of the house forms one side of the rectangle. Thus all four exposures are provided for plants. Nevertheless, the garden must be entered from the house and the exposure selected controls to considerable extent the terrace planting possible and exerts pressure upon the kind of garden developed.

One planned to the *north* of your house, for instance, may have to be in character more architectural than floriferous. Close to the house, possibly only tuberous-rooted Begonias can be depended on for summer color; or perhaps an evergreen garden of Laurel and Azalea and Rhododendron and Leucothoë and Hemlock and English Ivy will meet requirements best. I recall a heavily shaded garden—a brick terrace and court—which offered in contrast to masonry only specimen Yews and a reflecting pool. It was delightful. During those hours when the sun ventured to penetrate the garden's inviting coolness, shadow patterns added to seductiveness fully as much as brickwork, pool or greenery.

In concentrating so hard upon devising sunny positions for our flowers, we sometimes forget not only the pictorial but the practical value of shade. Such an oversight later calls attention to itself and demands correction. A *western* terrace will be uncomfortably hot in the early afternoon, unless a tree to the southwest tempers the sun's rays; and one to its northwest is indicated for late afternoon protection. A *southern* terrace requires an overhead covering, such as may be furnished by Grapevines or Wisteria, as well as a tree to the southeast and one to the southwest in order to be habitable during the better part of the day. An *eastern* terrace may be ideal at teatime; but it may be disagreeably warm—and in summer downright hot—at breakfast, should it lack a tree to the southeast.

Through its leaves, a large tree transpires hundreds of pounds of water daily. By thus releasing vapor into the air, it tends to equalize temperature much as might the spray of a fountain. Moreover, the amiable giant thrusts its bulk between you and the sun and shields you from its heat by deflection.

Three sizable trees, you see, are usually needed about a house for purposes of shade alone. We may want one more to bring the trio into balance; and perhaps a moderately large fifth somewhere away from the house—possibly at the far end of the property—will be essential to diversity and perspective in landscape structure.

Although all five will in most cases be deciduous, not all of them should be Gargantuan. On a small place the best result nearly always is secured when only one, or at the most two, is of a type which will reach great size at maturity. Superabundance of shade is depressing and should be avoided. And don't allow the trees to be placed equidistant from the house or to be lined up with each other, like a stockade—unless you do so for purposefully formal effect. Ordinarily, it's best to vary the distances in such a way as to achieve an apparently casual, but actually carefully balanced, frame.

If your lot contained a number of large trees, you have already decided (or the builder has decided for you) which were to be retained and which, if any, should be removed for the sake of general appearances and the health of those remaining. If you are setting out new stock, remember to allow for each ornamental tree a circle at least 40 feet in diameter. Weigh carefully the suitability of one species against another, form at maturity, root behavior and density of shade before you come to your final decision.

From a garden standpoint, shade trees are bad as well as good. Unworthiness on small places consists primarily of refusal to permit the growth of shrubs, perennials or grass beneath them. When space is at a premium, this defect is serious. Virtually all of the trees recommended on the following pages as substitutes for thoughtlessly but frequently planted poor lawn subjects are free from this discouraging fault. Considerable length is devoted to the subject. It deserves it. The right tree for the right place proves a constant joy; the wrong one, a never-ending annoyance.

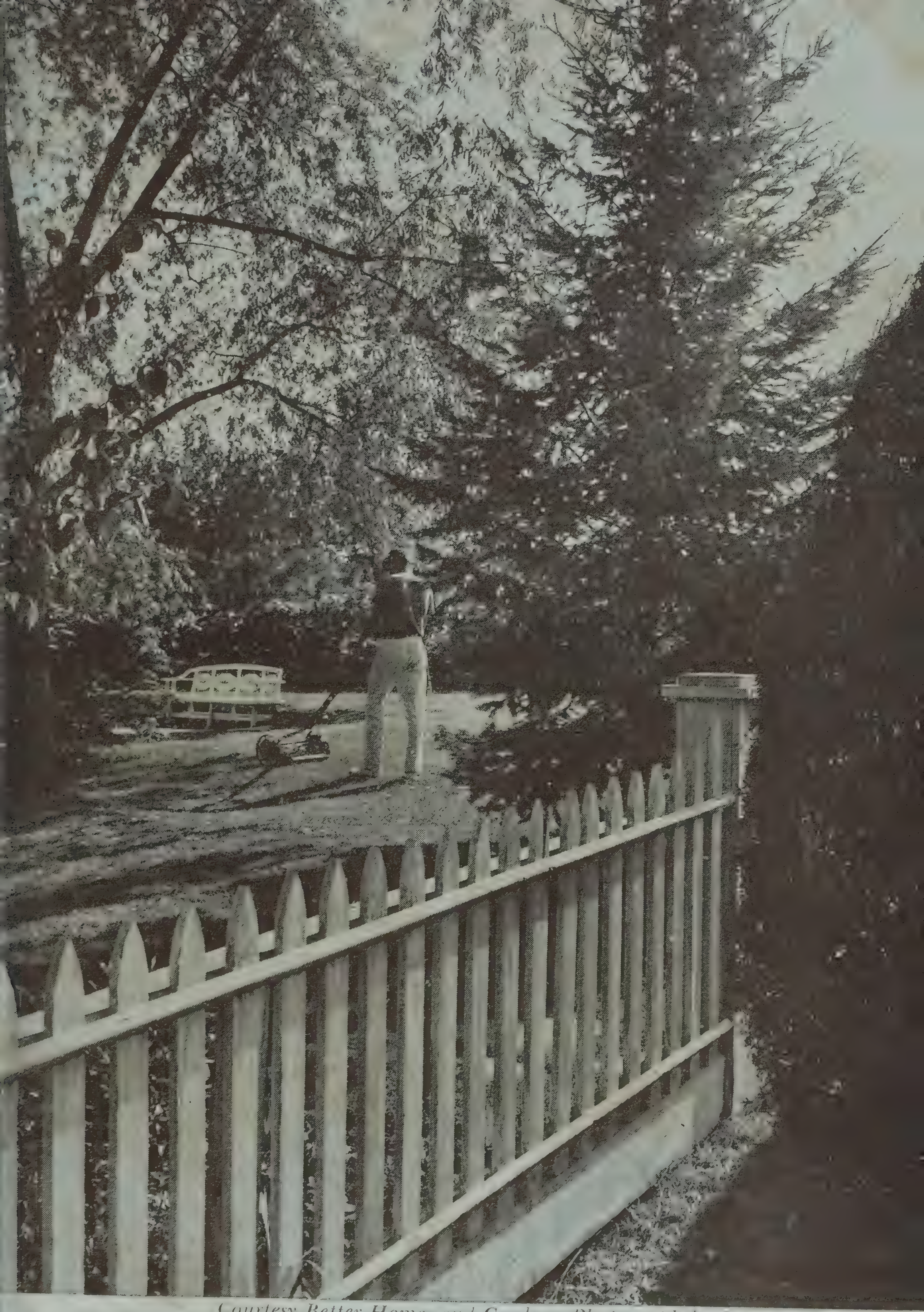
Trees with low garden ratings: Shun the Norway Maple (*Acer platanoides*) unless you're prepared for bare ground beneath its branches or for a lavish output of energy in inducing a ground cover to take hold or grass to germinate and live. This species is hardy, healthy and handsome, but a bad actor in lawns. Its shade is too dense, its roots too numerous, too close to the surface and too much like a fifteen-year-old boy in perpetually searching for food.

The Soft Maple (*Acer saccharinum*) transplants readily and wears good-looking fall clothes; yet it is brittle, short-lived, shallow-rooting and inclined to starve out the turf near it. It grows rapidly, but its top usually bristles with dead twigs.

Think twice before you plant a Cottonwood (*Populus deltoides*) or its variety, the Carolina Poplar. They make soft, easily snapped wood; they're untidy; and their roots raise hob with water mains and sewers. Some communities prohibit them altogether.

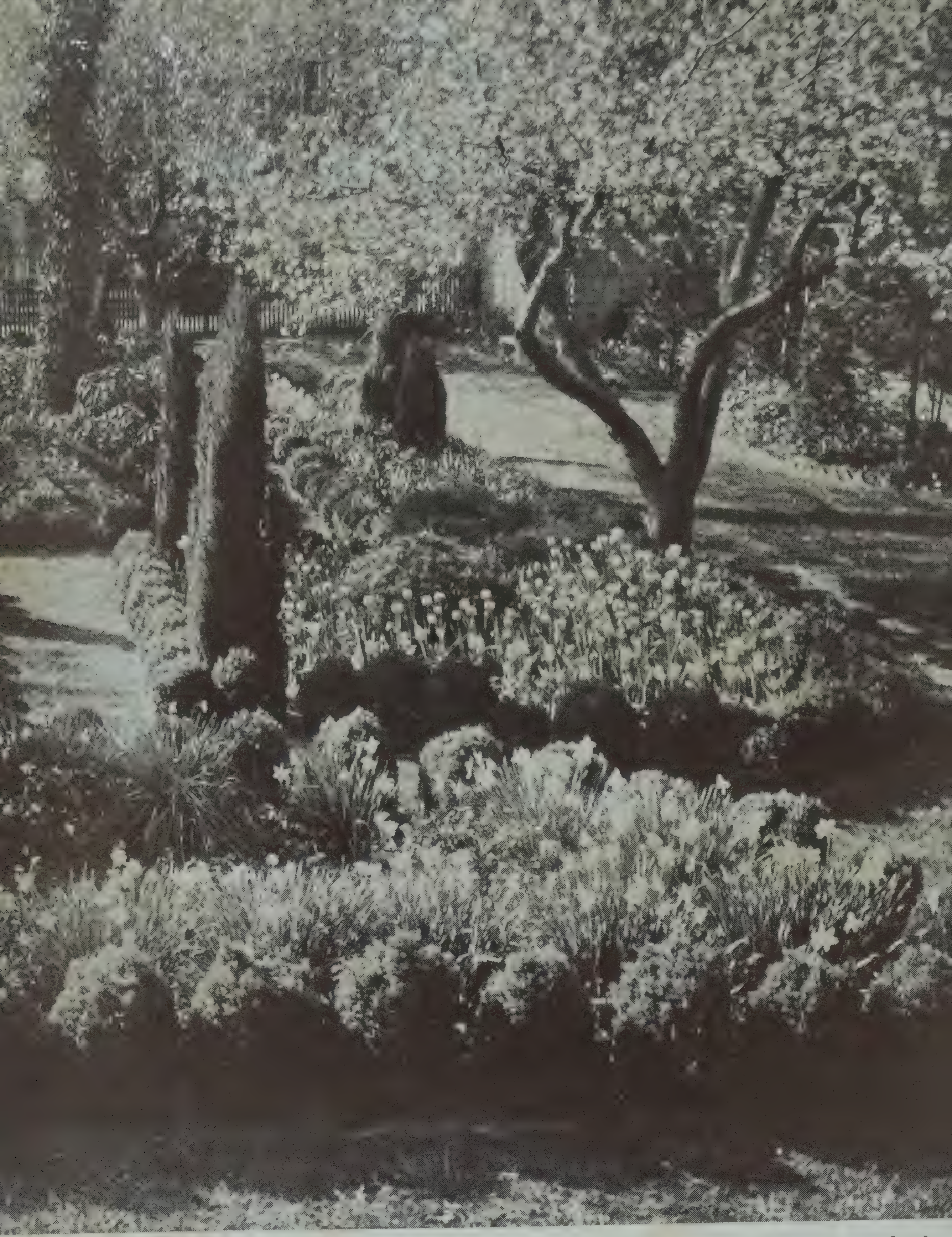
The Lombardy Poplar (*Populus nigra* var. *italica*) is frequently used for quick screens and for accent. There are better trees for these purposes. This variety has troublesome roots, suckers badly, is relatively short-lived and presents a ragged, moth-eaten appearance, when soil and climate aren't to its liking.

Count ten before you plant a Willow (*Salix*).



Courtesy Better Homes and Gardens. Photograph by Samuel H. Gottscho

Evergreens furnish accent and contrast in the small garden. Here Douglas Fir and American Arborvitae contrive with picket fence and garden bench to form an inviting pattern in black and white.



The naive beauty of an Apple tree contrasts with Tulip and Narcissus beds, formally edged with dwarf Box and accented with Irish Junipers, in Mrs. George C. Bounds' charming garden on Maryland's Eastern Shore.

ACC No. 1080

We'll grant them a place in wet ground; they're useful in holding the banks of streams; but as small garden subjects they're not among the bell ringers. They share the bad habits of the poplars.

Upon one occasion, I selected a moderately weeping variety of Willow (*Salix babylonica* var. *Salamonii*) deliberately to gain a preconceived old-fashioned effect. By means of a sunken stone-and-mortar wall I tried to control the direction of its root growth. This measure over a fifteen-year period has been reasonably successful. Yet I've reached the conclusion that several other species, demanding less in the way of mechanical discipline, would have served better.

Count to a thousand at least before you permit an Ailanthus (*Ailanthus altissima*) to take root on your grounds. If you have one, you'll have dozens; for they self-sow like weeds. Although admittedly striking, subtropical-looking things, rapid of growth, free from pests, withstanding smoke and dust and making headway even in city slums, the foliage gives off an evil odor when bruised. Nor is that all. This species is what is called dioecious: that is, the staminate (male) flowers and the pistillate (female) flowers are borne on separate plants.

The staminate flowers, to put it mildly, smell to high Heaven. If the modernistic angularity of this Chinese species is irresistible, by all means plant a pistillate form. If you live south of Norfolk, plant the pleasant Chinaberry (*Melia Azedarach*) instead.

Despite its violet flowers and its rapid growth, the Paulownia (*Paulownia tomentosa*) is better avoided. Blossoms do not last long and appear before the leaves; the wood is brittle, shade is extremely dense and the tree always untidy. It grows as far north as Baltimore. For southern California and the deep South, the Jacaranda (*Jacaranda ovalifolia*) is a similar tree—far superior in flowering habit and every other respect.

Trees with high garden ratings: The American Elm (*Ulmus americana*) is our most beautiful shade tree, I suppose, just as the White Pine is our noblest conifer. (See Chapter IX for a discussion of Evergreens.) Yet the prevalence of the Dutch Elm disease is a threat to give one pause. The battle against the deadly ailment is being fought with determination and along an encouragingly broad front. Viewing the situation realistically, however, we are forced to concede the possibility that our majestic Elm, which has glorified the landscape from Newfoundland to Florida and westward to the Rockies, ultimately may go the way of the native Chestnut.

No wholly satisfactory substitute for the native Elm can be nominated, but the Asiatic Elm (*Ulmus pumila*) so far seems able to resist the scourge and is a graceful and attractive candidate, well suited to small grounds. Do not confuse it with the shrubbier Chinese Elm (*Ulmus parvifolia*). The Asiatic species, often called Siberian Elm, is usually grown from seed and displays considerable variation. It may be round-headed, like a Norway Maple for which it's a good substitute; or approximate the much desired "vase form" of the typical American Elm. Choice after examination in the nursery row is therefore more likely to please the purchaser than ordering sight unseen. The Asiatic species grows very fast during its youth, on an average reaching nearly 40 feet by its tenth year, and is easily transplanted when dormant.

Splendid trees, in outline and mass resembling elms, are the Hackberry (*Celtis occidentalis*) and its smaller southern cousin, *Celtis mississippiensis.* In some parts of the country a disease known as "witches' broom" is troublesome, but the native hackberries or sugarberries are freer from pests than elms, thrive in almost any soil, grow fast when young, withstand drouth and are easily transplanted. Should one ask for more?

The Oaks, as everyone knows, are immensely valuable street and forest trees. Many are too large for small places. The famous Wye Oak, near Chestertown on Maryland's Eastern Shore, spreads a cathedral-like gloom, for example, over a space equal to several city lots. Yet not all Oaks are overpoweringly huge; nor do all of them, contrary to popular belief, grow by inches. The Red Oak (*Quercus rubra*) may produce as much as three feet of new wood in a single year. It makes a broad and beautiful tree, perhaps 80 feet tall, full of the robust charm which characterizes the genus. The Red Oak isn't difficult to transplant. Neither is the fast-growing Pin Oak (*Quercus palustris*) with its sharply cut foliage, or the coarser Black Oak (*Quercus nigra*). Nursery-grown specimens are safest to move. Besides, since more than 200 species of Oak are known and some are better adapted to local conditions than others, consultation with a reliable nurseryman is a form of insurance. For every part of the country there is a fine oak—even for California which, in horticultural matters, is more or less a law unto itself.

The Tulip Tree (*Liriodendron Tulipifera*) is an admirable lawn tree. Often called Tulip Poplar or Yellow Poplar, it is not a poplar—either botanically or in deportment. Grass and other plants grow well in its light shade; foliage is clean and of a striking bluish-green tint; the tulip-like flowers, a source of honey in May and June, are agreeable and the fall color, a brilliant yellow, further commends it. Its natural range is from Massachusetts to Wisconsin and south to Florida and Mississippi and its preference is for deep rich and somewhat moist soil. Fairly adaptable as to soil, it is not the easiest plant to move. Transplanting should be undertaken in spring, just as buds begin to swell, and with small specimens. This requirement isn't objectionable for the noble native grows rapidly, eventually reaching a height of 150 or more feet.

As a substitute for the Lombardy Poplar, a fastigiate type of Tulip Tree (*L. Tulipifera* var. *pyramidale*) suggests itself; while a slower-growing alternate is a variety of European Hornbeam *(Carpinus Betulus* var. *fastigiata*).

Another tree to use in place of Lombardy Poplar, though it grows slowly, is the sole surviving species of a tribe numerous in geologic times, the Maiden-hair Tree (*Ginkgo biloba*). As a single specimen, the Ginkgo is most picturesque. Usually slender and sparsely branched, the fernlike foliage throws a light shade which does not retard garden plants unduly. It seems entirely free from blight or insect and withstands city conditions. After attaining considerable size, a drawback may develop in the fruit, a soft pulp surrounding an edible nut. This ripens and drops in early summer and during the process emits the foulest of odors. The fruit may be picked when green; or, better still, plant only staminate (male) trees and eliminate the cause.

The magnificent Sweet Gum (*Liquidambar Styraciflua*) can surely be counted upon for any effect a Lombardy Poplar may be able to supply; and more besides. Though it is somewhat hard to transplant (spring is the best season and hard pruning should follow a move), the deep crimson of its maple-like foliage in autumn is alone reason enough for more extensive use. Add to that freedom from diseases and insects, a pyramidal, very symmetrical form, and a wide natural range—from Connecticut to Florida and westward to Illinois and Missouri—and you have a gem. The Sweet Gum prefers a moist situation, but is reasonably tolerant of soils and of salt air.

In spite of its thorns, the common Honey Locust (*Gleditsia triacanthos*) seems to me a better tree than the ailanthus in its structural geometry; and, as a garden visitor, it is vastly superior. Incidentally, don't confuse the Honey Locust with the highly fragrant Black Locust (*Robinia Pseudacacia*), which is valuable for fence posts but, because of a borer which attacks it and its tendency to sucker, is not highly regarded for limited landscapes. The two trees, as you see, aren't of the same genus; and the Honey Locust is far more personable.

The thornless variety of Honey Locust (*Gleditsia triacanthos* var. *inermis*) in a bulletin issued a few years ago by the Morton Arboretum received the highest rating of any tree, as a lawn specimen of all-around dependability. Unfortunately, the variety seems rather rare, but it's well worth searching for. Vigorous, fast-growing, highly resistant to disease, insects and drouth, it reaches a height of from 70 to 140 feet. Branching high, broad-headed, loosely angular and graceful in the extreme, plants can be grown without difficulty in its light and airy shade. It takes kindly to pruning and transplanting. Leaves are a bit slow in appearing, a bit quick in falling; and, for a time, dropping seed pods are unsightly. These are minor liabilities, however, when compared with the tree's decorative assets.

Another fine native, available nowadays in many nurseries, is the Kentucky Coffee Tree (*Gymnocladus dioica*). Its natural range is from central New York to Tennessee and westward to Oklahoma and Nebraska. This species may become 100 feet tall and with its large compound leaves and conspicuous, persistent seed pods is unusual and handsome, especially as it ages. It is thornless, perfectly hardy and apparently unmolested by disease or insect. Before and during the Revolution, coffee (of a sort) was made from the seed. I have tasted it and I'm sure this crop need not disturb the slumber of anyone in Brazil. From my workroom window I can observe a forty-year-old specimen. In view of its bold landscape effect, it's a mystery why the species has not been planted more widely.

Smaller, secondary trees, though perhaps not so likely to make or mar a small place as a predominant shade tree of noble proportions, are none the less important. As a rule, selection may well be made from among the flowering trees, apart from conifers and birches (*Betula*). The latter, though some of them are marvelously effective in certain garden situations, are distinctly northern trees and succumb more quickly to enemies the farther south they're tried. Seedling birches less than a year old, incidentally, can sometimes be established where older trees would fail. In the garden proper, flowering trees should be given preference. Crabapples and Hawthorns and Golden-rain Trees and Magnolias and Flowering Cherries and Shadbushes and Judas Trees—what a wealth of beauty they represent.

We shall have more to say about them later (Chapter V). However, there are three flowering trees which are not only superlatively adapted to small gardens but can be used close to the house at times with telling effect: the Dogwood; the Yellow-wood or Virgilia; and the McIntosh Apple.

The Dogwood (*Cornus florida*) in my opinion is Number One on America's list of flowering trees. It is widely known, of course, but is planted far too infrequently in small gardens. Because it grows as a luminous underplanting to towering forest trees, perhaps the notion is entertained that it is intolerant of sun. Such is not the case. It adapts itself to virtually all conditions of sun, shade and soil. The species may be used as a specimen, in the shrubbery, or in the flower border itself, for it doesn't object to close companionship. From a landscape standpoint, the fact that Dogwood emphasizes horizontal lines may be particularly valuable. Trees of fair size are usually moved with an earth ball in spring as the buds start; but I have also grown it from dishearteningly dry-looking dormant nursery stock. In the latter case, the young trees are cut back to within a few inches of the ground. Of course, this is slow business but it is a cheap way to acquire them in quantity. (Kelsey Nursery Service, 50 Church Street, New York City—to mention one source with which I'm familiar—offers seedlings at about $8.00 a hundred.) The white type is hardier than—and generally superior to—the pink variety (*Cornus florida* var. *rubra*). The latter may be excellent as an accenting specimen, however; and there's a nice Japanese species (*Cornus Kousa*) which flowers in June after its leaves appear. It's dwarfish, averaging perhaps 20 feet; the eastern type is likely to become no taller than 40 feet; and a tender western species (*Cornus Nuttallii*) may reach 80 feet. There are a number of first-rate shrub dogwoods, too.

The Yellow-wood (*Cladrastis lutea*) is native to Kentucky, Tennessee and North Carolina but has proven hardy as far north as Massachusetts. The head spreads gracefully; bark is gray and smooth; bright green compound leaves turn yellow in fall; and panicles of white, fragrant flowers, suggesting Wisteria, appear in June. It withstands drouth particularly well and may reach a height of 50 feet. Diseases and insects apparently do not trouble it. Limestone soil is preferred, but many good nurseries now stock the species offering it, as a rule, balled and burlapped so that it may the more readily become established under varying soil conditions. The tree is not at all expensive.

The McIntosh Apple (McIntosh Red) has long been known as a fine fruit tree. The original McIntosh tree died in 1908, aged 112 years, and its memory is kept green by a monument erected by popular subscription at Dundela, Ontario. A few other apples have been similarly honored. As a flowering tree for garden or lawn, however, I am inclined to think its worth has not been fully recognized. To me its deep red buds and its pink open blossoms exceed in beauty all other apples. Moreover, it grows fast; often bears in the eighth or ninth year; and is tall enough to serve as a shade tree, though size and shape can be controlled to a certain extent. Incidentally, the McIntosh is thought not to be self-pollinating and therefore one of another kind should be set out, say 30 to 40 feet away from it—the variety, Wealthy, perhaps, since it is very fragrant. Pruning and spraying, as is the case with all apples, are necessary chores, but the tree does well in turf and may be very happy in a wide flower border. I have used standard apples, as well as crabapples, in that manner and have found Narcissus, Wood Hyacinth, various types of Primula and blue *Phlox divaricata* to be eminently content in their shade. If McIntosh does not suit your region well, your state experiment station will be glad to recommend varieties fitting local conditions.

The tone of a small property is established more by its shade trees, I suspect, than by anything else except the house itself. Shape of plot and the architectural features included in it bear heavily, of course, upon the interpretation of a garden tradition. Yet plant material in most small gardens may proclaim a style as tellingly as other factors.

Every tree, every shrub, every herb possesses intrinsic character, expresses formality or informality in varying degree. Many plants, moreover, have built up in our minds strong geographical or stylistic associations. Boxwood symbolizes Colonial days. The American Elm denotes New England. The perfumed Magnolia conjures up the suave elegance of an ante-bellum South. Espalier fruit trees and topiary work signify France as promptly as do elaborate parterres. Colonnades of somber conifers hint at Italy as broadly as do marble *termini.* And parklike lawns or herbaceous borders have come to bespeak the British Isles no less succinctly than do dry walls or flagstone terraces. All such particularized qualities are adept in conveying the atmosphere of a period without forcing slavish reproduction of its gardens.

In the final analysis, the pervading spirit of the garden is the owner's personality. Consciously or subconsciously, his taste and thought are reflected in every decision he (or more often she) reaches; and the sum total of these decisions makes up the garden's artistic entity. Fundamental architectural character will be inherited from the house. The garden's temper will be modified, for good or ill, by the sorts of trees adjacent to, or within, it and by the types of shrubs and perennials and lawn areas employed. But the owner is the directing intelligence, the judge who decides what shall compose the living picture.

Like a landscape painting, a garden ranks as fine art in accordance with the degree to which a central theme is adhered. A mood must be captured and sustained. And when this mood, this essential spirit of the garden can be consciously defined and consciously accepted as a standard in the exercise of judgment, the garden maker's burden, I submit, will be greatly lightened.

Suppose, for example, a setting of "sophisticated dignity" is the aim. At once the phrase inspires thought along formal lines. Geometric patterns of brick paths, perhaps, edgings of trimmed dwarf Yew framing beds filled with the newer perennials in unhackneyed groupings and backed by brick walls relieved by pear trees trained as cordons: associations of this nature will float to the surface of the mind. Again, should the goal be "old-fashioned restfulness," imagination will summon visions of fair green turf, ancient apple trees and fragrant flower beds, tall lilacs and redolent boxwood drowsing at a picket gate. Let your mind help your garden. Harness it with words. Search out the precise phrase describing what your garden ultimately should represent. The phrase alone, the words themselves, will release creative resources you did not dream you possessed.

Errors in plant detail—with the exception of trees selected, since they require years for mature effect—should not be too upsetting. Substitutes for shrubs or perennials are easily acquired, changes easily brought about. In the process, indeed, is concealed much of the fascination of gardening. As season follows season, mistakes lessen. For in small gardens most of them arise from lack of knowledge, which experience helps to cure; lack of restraint, which will power can prevent; or lack of taste, which education may correct.

If, in spite of sound and simple basic design, plant details are not pleasing or as satisfying as they might be, one or more of three causes is likely to lie at the root of the difficulty. Plants may be:

1. Too Big
2. Too Many
3. Too Fancy.

Errors in scale—the most common of mistakes—follow the omission of planning, as night does day. The drawing of a basic landscape scheme, in which plants are shown as of mature size, will usually circumvent such flaws. Sometimes, saw and pruning shears can rectify blunders after they've occurred. And a more patient attitude toward the realization of mature effects, perhaps, will do more than anything else to save the gardener from slips in scale. Just remember that trees other than maples grow fast, too.

Errors in crowding result from vaulting ambition, a desire to try every plant you hear about; or, like accidents in scale, from failure to calculate properly the rate of growth. Don't spatter your lawn with shrubs, don't break up your restful lawn spaces—just because catalog pictures intrigue you. Remember your central theme, whatever it may be, and resist temptation. Whatever your garden slogan, it could hardly hold up as an ideal a shipping-room scramble. You wouldn't jam the rooms in your home so full of furniture as to make it difficult for people to move about in comfort. Why do it outdoors? Don't think, either, that because one oak is handsome, three will triple the magnificence. Such profligacy, instead of expanding your bubble of beauty, may only burst it in a hail of acorns.

Errors in taste, so far as plant material is concerned, mean anachronistic specimens. Time passes. Fashions in plants change. We must not let our gardens stand still; for those which attempt it have their futures behind them. We must keep up with the garden procession. At one time, every gardener yearned for a Blue Spruce; Crown Imperials accented many a proud planting; and the oversize foliage of Caladiums flanked many an exclusive doorway. Today the Blue Spruce, strong and striking and clean though it be, is considered too sharply contrasting for garden use. The Crown Imperials have been ruled guilty of an offensive odor. As for Caladium—well, we needn't go into that. Anyone who'd think of growing Elephant Ears nowadays would surely not be reading a garden book.

Summary of Chapter II: *Although the style of a small garden is a matter for individual determination, a brief historical survey shows a marked trend away from artificiality and toward natural simplicity and seclusion. Interest in personal gardening is growing rapidly; and American gardening, as a result, can be said to be coming of age.*

While eastern and southern exposures are most favorable, an interesting small garden can be worked out on any side of a house—north, east, south or west. Each presents different problems, especially with regard to shade. Practical as well as pictorial value of shade should not be overlooked.

From a garden standpoint, shade trees can be both bad and good. Seldom should a small place accommodate more than one large tree. Choose *with care. Avoid Norway Maple, Soft Maple, Poplars, Willows, Ailanthus, Paulownia. Consider instead Asiatic Elm, Hackberry, certain Oaks, Tulip Tree, Ginkgo, Sweet Gum, Thornless Honey Locust, Kentucky Coffee Tree and flowering trees, particularly Dogwood, Yellow-wood, Apple.*

Intrinsic plant character helps to interpret garden tradition without copying, although fundamental character derives mainly from architecture of dwelling, modified by trees. Owner's personality, in final analysis, is the pervading spirit; but a small garden ranks as fine art in accordance with the degree to which a central theme is adhered.

When basic design is sound and errors in plant detail are present, they may have occurred because plants are: 1. Too Big; 2. Too Many; 3. Too Fancy. Such mistakes, though not unduly disturbing, result from lack of knowledge, lack of restraint, lack of taste.

CHAPTER III

HOW TO CREATE GOOD GARDEN LOAM

The Urge to Dig Is Justified; What Soil Is; How to Condition Soils for Best Results; Trenching or Double-digging; What Is Meant by Acid or Alkaline Soil; Routine Cultivation and Feeding; The Value of Compost and How to Make It; Spent Mushroom Soil; Summary.

I am afraid my friend, Henry Beetle Hough, is hopeless. He and his wife are editors and publishers of the prize-winning *Vineyard Gazette* and, to counteract the strain of that unique office, at times they embrace the healing art of horticulture. No matter how eloquently I argue, however, I can't persuade Henry to become a garden maker. He *will* dig; but he won't plan. Observe in this excerpt from a recent letter with what cunning plausibility he presents his case:

> In January there was some warm weather, and I said: "I feel like digging up some ground. Suppose I prepare a garden bed." Betty said: "All right." So I said: "It will be easy digging here. How about having a garden here?" Betty said: "All right, I guess so." So I dug up a new garden bed, which has no axis and no possible relation to anything else on the place; in fact, you can hardly see it from the house, except from one dining room window or the kitchen. But it was fun to dig.
>
> Then we got Burpee's catalog and the pictures of the Sweet Peas were quite pretty this year, and so I said: "Let's have some sweet peas." So we are going to have some sweet peas, and some muskmelons, and some more tomato worms. (We did so well with them last year.)
>
> I should not tell you this, because it shows we do not profit by the intelligence available to us in books. But that is the point after all. Unsystematic, erratic souls greatly like to have a source of sound advice. By following just a little of the sound advice they can justify a lot of fooling around that never comes to anything.

A grain of salt is served with this philosophical revelation. You'll note that Henry loves to dig. A man or woman who loves to dig—though I, myself, see no objection to having back-breaking jobs performed by someone else at so much per hour—is in a fair way to appreciate the advantages of a well-worked, well-conditioned soil. Whether these athletic ones merely grow flowers or practice the higher art of using plants in the creation of garden pictures, they will come to recognize why emphasis upon the raw material of the craft is abundantly justified.

That I would in no way detract from the value of design or seclusion or diversity in garden making must be self-evident. Nevertheless, to my own horticultural peace of mind nothing has contributed so greatly, I believe, as a realization of the importance of properly conditioning the good earth. I should like to underscore that concept; and to pass on that peace of mind.

To bring an average soil to a high point of mechanical and chemical efficiency takes time and costs money. Paradoxically, conscientious preparation eventually saves hours and decreases expense. Thorough treatment insures healthier specimens and fewer disappointments; makes possible greater latitude in the choice of plant material; reduces the effort required to maintain a mellow and productive medium.

Furthermore it produces in us, besides enabling us to grow better plants with less cultural exertion, a deep inner satisfaction. This result is sensed rather than seen. It is none the less profoundly true. Every man or woman, who ever gripped a spade, has been conscious of it. The most phlegmatic digger has been made aware, at some moment, of his kinship to the eternal clay. To toil with the dust, whence he sprang and to which he must return, is curiously comforting to the soul of man.

Apart from such spiritual considerations, we shall be helped toward understanding something of this therapeutic miracle in which we gardeners share by approaching the subject upon a matter-of-fact, analytical basis.

What is soil? It is interesting, living stuff; not just plain dirt, a substance to be taken for granted. Too often neglected, the soil is the primary source of health and happiness of its vegetal inhabitants.

Plant life, to be sure, can be sustained by means other than garden soil. Material may be limited, for example, to species which a natural soil can support; or plants may be raised in water containing nutrient salts, a still experimental craft often termed water-gardening or hydroponics. But so long as man builds his dwelling upon the earth and strives to beautify his environs, the principal medium for the growth of decorative plants will be garden soil.

Basically, soils are of two types: organic, or peat, soils; and mineral soils. In spite of wide variations in color, texture and other qualities, all good soils have in common five things:

1. The *soil grains,* fragments of rock which may be as coarse as sand or as fine as clay particles.

2. *Organic matter,* the decayed remains of plants and animals.

3. Alive and active microscopic plants and animals, chiefly the *bacteria* which break down organic tissue into forms capable of assimilation by living plants.

4. The *soil solution,* water containing dissolved salts essential to plant life.

5. The *soil atmosphere,* necessary to the proper

breathing of plant roots and to bacteria, and much like the air above ground except that more nitrogen and carbon dioxide are present.

A number of chemicals are called for in plant growth: nitrogen for green growth; phosphorus for good of seed and blossom; potash for strength of root and stem; and the so-called trace elements, like magnesium and calcium and iron. Percentages of the first three elements mentioned are indicated on containers of commercial fertilizers in the order named. Vigoro, for instance, is a 4-12-4 formula—4 per cent nitrogen, 12 per cent phosphorus, 4 per cent potash—though it contains other elements as well. With the exception of these three principal elements, deficiencies in which are usually made up by the application of commercial "plant food," most soils contain the vital chemicals in sufficient quantity. Still, they must be available to plants, not locked up out of reach of feeding rootlets. From the garden maker's standpoint, therefore, not only its chemical constituents but a soil's mechanical condition (the proportion of sand to clay) and its organic content, which regulates its ability to hold water, are of great consequence. What is needed to mature the higher order of plants is a soil of workable texture and spongelike consistency, capable of keeping the maximum quantity of nutritive substances in solution without excluding air; in other words, without becoming waterlogged.

Upon garden soil, you see, we make rather unreasonable demands. We insist that it be well aerated, without drying out roots; that it retain moisture, while draining perfectly; that it be heavy and rich and friable and porous all at the same time. And that it be, in most cases, neutral or only slightly acid in order to embrace the tolerances of the largest number of plant types.

We're aware that an airless, tightly packed medium resists the gardener's ministrations, burns up his energy disproportionately, and tends to produce dejected root, branch and blossom. On the other hand, we know amiable earth can be worked with modern tools (see Chapter XI) at rates of speed truly astonishing. Moreover, we count upon border soil to nourish both shallow-rooting annuals and comparatively deep-rooting perennials; to house, in fact, a host of species and varieties which, in the natural course of floral society, would not be known to each other even by their family names. And yet when failures occur—as they must in the best of gardens—we blame the climate, the rainfall, the neighbors' pets, the nurseryman, the plant itself, anything but the soil, although we may have done little or nothing to increase and maintain its fertility.

Ideal border soil in nature is conspicuous by its absence. Few, if any, gardens start their careers equipped with perfect soil. To meet our manifold requirements, nevertheless, garden soil must be acquired; and thus we're compelled to manufacture it. The finished product we identify by a trade name of sorts: we call this medial fabrication, this complaisant, synthetic substance, *good garden loam.*

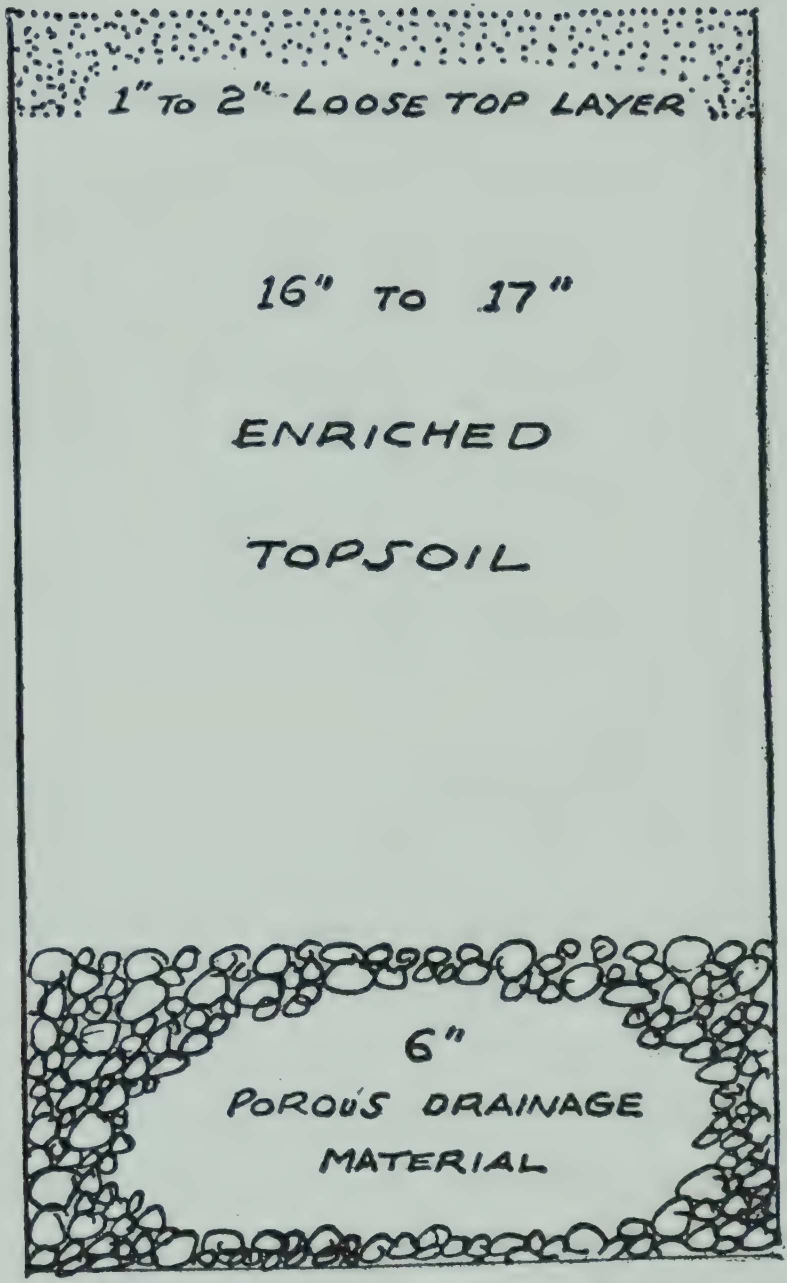
Now, natural loam is a mixture of clay and sand in such proportions as to overcome the clay's inclination to form a coherent mass. It is fine-grained, homogeneous, light. Add to a natural loam (which is what we obtain when we collect or buy topsoil) large quantities of decaying organic matter, either animal or vegetative mold (humus), and we create with Nature's weathering aid a good garden loam. Dust on a light covering of a complete chemical fertilizer—for grass, a 10-6-4 formula; for flowers or vegetables, a 4-12-4, a 4-8-5, or a 5-8-7 compound—to make certain no essential elements are lacking and we have come as close to making an ideal soil, provided we feed and cultivate it regularly thereafter, as most of us can and still remain practical people. (Of course, when we run a soil test, or have one run for us, we can proceed toward correction much more intelligently; and on that score we'll have more to say presently.)

But, you may ask, am I supposed to move and mix enormous quantities of earth until I've contrived for all my beds and borders a bountiful growing medium? Am I supposed to add this and that until all the soil in my garden—no matter what it was at the start—holds moisture but crumbles readily and won't bake hard or crack as it dries out? In a word, the answer is: "Yes." Don't let the prospect appall you, though. Amelioration of soil is nothing like so strenuous as it sounds. Given customary garden conditions, the process of converting average soil into better-than-average loam may be boiled down to three short rules:

1. Dig deep
2. Add humus
3. Feed plants.

Consider the architecture of an ideal flower bed. Picture to yourself a cross-section so that all your beds and borders gradually may be rebuilt into an approximation of perfection. If you feel discouraged, just remember that upon the *concrete roofs* of Rockefeller Center in New York City, in properly made beds, are growing evergreen hedges and lawns and bulbs and roses and herbaceous perennials galore.

The ideal outdoor garden bed is two feet deep. Its bottom six inches will be gravel or cinders or potsherds or chopped sod or some other porous material which will insure under-drainage and prevent standing water from rotting roots. The next seventeen inches will be an enriched topsoil, a slightly acid or neutral loam—sufficiently compacted to exclude air pockets, sufficiently open to permit air circulation and easy root penetration. The top inch will be light, loose and fluffy: a covering, in short, either of stirred and thus well-ventilated soil, which is called a dust



Cross-section of an Ideal Outdoor Flower Bed: At the top is a loose, well-stirred layer of soil from 1″ to 2″ deep; next, from 16″ to 17″ of good garden loam; and, at the bottom, 6″ of chopped sod, gravel, broken flower-pots or other under-drainage material.

mulch, or of an inch of peat moss (or some other similar spongy substance, free from weed seeds) worked into the top inch of soil. This airy blanket, this mulch (to repeat its technical name) tends to keep down weeds which, apart from appearances, would rob more desirable plants of nourishment and might harbor fungus or insect pests. More important, the mulch lessens loss of moisture through evaporation.

A bed, so constructed and so mulched (or cultivated), will furnish congenial quarters for a wide range of plants: virtually all, indeed, of the garden plants with the exception of the relatively small, so-called ericaceous group—members of the Heath family, notably the broad-leaved evergreens, such as Rhododendrons and Azaleas, which require a definitely acid soil. Moreover, with little effort the bed may be kept in splendid condition by following each year the three short rules: Dig deep; add humus; feed plants.

We mustn't, you see, lose sight of this fact: *Good garden loam, once it's been created, won't retain its abnormal fertility without after-care.* To experienced gardeners, this is obvious. Yet many worthy people who like flowers seem to think that garden maintenance consists merely of having the grass cut. Often, they appear to consider soil as chemically inexhaustible; and physically permanently fixed. Actually, chemical elements withdrawn by plants must be replaced, and physical structure must be kept at a constant point of excellence by additions, usually annual, of humus-making materials and by frequent cultivation. If it weren't for weeds, most of us must confess there'd be precious little tillage in the average garden; while feeding is in danger of degenerating into over-feeding with widely advertised, principally inorganic compounds. Should the subject of soil husbandry prove especially appealing, I suggest you try to get hold of a copy of Prof. L. H. Bailey's textbook, first published in 1898, *Principles of Agriculture* (Macmillan).

A practical example of the construction of an actual flower bed should be helpful; for, after all, horticulture is largely an empirical art. Of course, when general principles are clear to us, too, their application to a variety of specific conditions becomes simplified.

Not long ago, I made a flower bed in a naturally heavy clay soil. The bed was 10 feet wide and 24 feet long. The original conditioning of these 240 square feet cost about twelve dollars, or five cents a square foot. Subsequent soil maintenance will probably come to two or three dollars a year. The first plants raised in the bed (mostly annuals from seed) cost a couple of dollars. These figures are interesting, I think, because they represent the expense ratios usually encountered.

Procedure was as follows: Soil was removed from the bed to a depth of two feet. Topsoil and subsoil were kept in separate piles. (Parenthetically, topsoil is the upper few inches of the earth's crust which, by action of sun and wind and rain and frost and by death of successive generations of plants and animals, has been rendered fertile—that is, capable of maturing a crop. Subsoil is the lighter-colored earth beneath the topsoil. The main difference between them lies in the greater organic content of the topsoil. Subsoil has been defined as rotting rock; and topsoil as rotting subsoil.) The bottom of the bed, which was clay subsoil or hardpan, was loosened with a mattock and mixed with leaves, of which there chanced to be a plentiful supply. On top of this went six inches of coarse, bank-run gravel and a small amount of hard coal ashes—drainage material which happened to be available. Next, six inches of subsoil mixed with about 30 per cent by volume of commercial humus (leafmold, obtainable by the bag at most good seedstores) slid into the bed. The remaining subsoil was discarded. The rest of the bed—the all-important top twelve inches—was filled with topsoil with which 600 pounds of commercial humus, 100 pounds of granulated cow manure, and a bale of peat moss had been incorporated. A light top-dressing of Vigoro cultivated into the top two inches finished the bed. After the soil had settled an inch and a half, the bed was planted.

While this bed grew chrysanthemums, roses, petunias, flowering tobacco, zinnias and various other plants quite well the same season it was made, several years of routine maintenance must elapse before correct mellowness can be attained. Still, the three short rules—dig deep; add humus; feed plants—will achieve the ideal in time.

What we start with, once in a while, can scarcely be dignified by the name of soil. It may be nothing but shale or gravel and so have to be replaced by topsoil, purchased by the cubic yard. Both price and quality of topsoil are determined by local conditions. Considerable variation must be expected. There's one thing we can pretty well count on, though, no matter where topsoil is procured: it will be full of weed seeds, which will demand more than average cultivation during the first season. Nor is it, either in physical or chemical condition, likely to be the answer to a gardener's prayer. The topsoil will form the base for a good garden soil, of course; and after it has been forked and aerated many times and balanced plant food and humus-making materials have become an essential part of it, it *will* be a good garden soil.

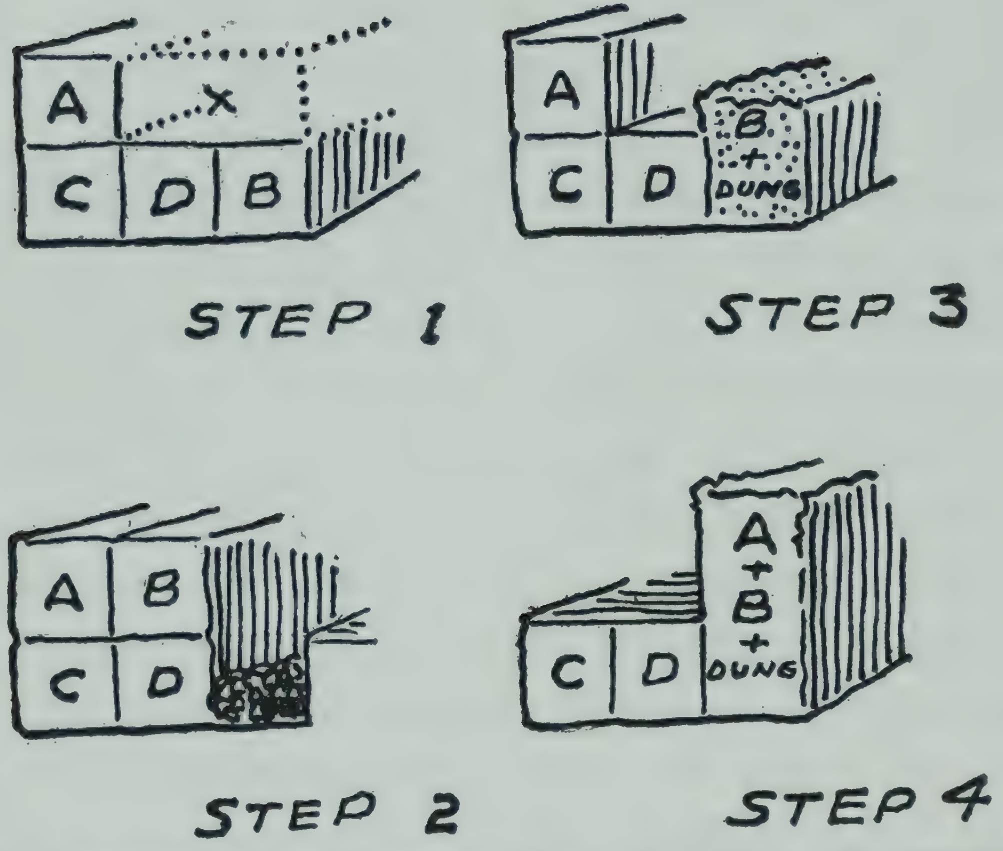
It is well to mention at this point an easily procured, organic commercial product which, as a conditioner of soils of various textures, deserves an exceptionally high rating. This is Driconure, or Improved Driconure as it is now called, a combination of cow manure, poultry manure and peat moss. It retails for about $3.00 a bag (2 bushels) and is probably stocked by the good garden supply stores in your neighborhood; or, in any event, can be secured through Atkins & Durbrow, Inc., 165 John Street, New York, N. Y.

Imported topsoil, unfortunately, is not a panacea for garden ills. Often, better results in the long run may be secured by bringing into sound condition the natural soil already at hand on your plot. Make certain, first of all, that under-drainage is suitable. This will go a long way toward curing trouble with wet or heavy soils, or soils in shade. To a clay soil, add sand and humus. To a sandy soil, add organic matter. To all garden soils add, as spring growth begins, plant food.

Quite often, the existing soil in a situation marked for border development is fair—certainly too good to throw away and replace by bought topsoil. When under-drainage is acceptable, probably all that is needed to create a favorable medium is working, enriching and the addition of humus. In such cases, a thorough treatment is best accomplished by a simple spading technique, known as *trenching* or *double-digging*. This consists in removing the topsoil, digging into the subsoil a builder-upper, such as Driconure or shredded cattle manure and bonemeal, returning the topsoil and pulverizing it, while working in fertilizer—for instance, sheep, cow, or poultry manure and bonemeal or superphosphate (10 pounds to each 100 square feet).

So long as the topsoil is kept on top and the subsoil on the bottom, the means whereby this deep digging is accomplished do not matter. One easy method of procedure is as follows: From one end of the bed—the right-hand end, let us say—remove a strip of topsoil, perhaps two feet wide, and pile it at the left-hand end of the bed. In the exposed subsoil at the right, dig a trench the width of the border, thrusting the spade as nearly straight down as you can conveniently and piling the earth in a ridge beside the trench you are making. This ridge will be to your left on top of subsoil. Now fill the trench half full of manure, or whatever conditioner you are employing. Return the subsoil, mixing it with the manure. Cover the mixture with topsoil taken from that on your left hand, thus exposing another narrow strip of subsoil. Repeat the operation, moving strip by strip toward the left, until all the subsoil has been dug and manured and covered by topsoil. Then, work over and enrichen the topsoil. But don't fork too deeply, for you do not want to bring to the surface the buried manure and subsoil.

After the work is completed, the bed, of course, will be several inches higher than it was at the start. Allow time for settling before planting; or,



One easy way of trenching or double-digging: Step 1—Remove strip of upper soil (X) and place at other end of bed to be worked; Step 2—Place spit (depth of a spade-blade) B on top of D and fill trench thus made half full of manure or other humus-making material; Step 3—Return spit B and mix with manure; Step 4—Place topsoil spit A on top of B, and continue the sequence until bed is finished always keeping top spit on top and bottom spit on bottom. Then enrich and work top layer.

essential compacting may be speeded up by light rolling or by walking on the surface and then once more cultivating the top two or three inches.

Double-digging is a good trick. By means of it border soil can be put into first-rate shape for perennials fairly quickly and, with routine feeding and cultivation, the soil is likely to remain in good condition until changes in the border present an opportunity for reworking portions of it—a period, possibly, three or four years in duration.

Neither lime nor well-rotted stable manure—two stand-bys of an elder day—has been mentioned in our discussion. There are good reasons for not stressing them. A reliable soil-conditioner, stable manure, since the family car has replaced the horse and buggy, often cannot be had for love nor money. Most amateur gardeners must turn to peat moss or commercial humus or dried dungs, like sheep or cow manure, for physical soil improvement. And for dietary deficiencies primarily to commercial fertilizers.

Lime is useful, to be sure, in correcting soil acidity and in rendering the earth grainy and easily worked, a structural alteration called flocculation. But lime can also be harmful. Some plants—such as Clematis and Dianthus and Delphinium—love it; others—Watermelons, Lupines, Blueberries and particularly Laurel, Azalea, Rhododendron and conifers—find it definitely poisonous. Unless a test has indicated a need for it, lime should never be applied; and then sparingly—4 pounds to each 100 square feet, either of slow-acting ground limestone or more rapid hydrated (slaked) lime. The effect of such a standard dose generally wears off in about two years. Lime and manure should not be applied the same season, lest the more rapid breakdown of manure due to the lime cause the release of carbon dioxide in the soil in toxic quantities.

Your state experiment station or your seedsman or your grass specialist will often test a sample of your soil without charge. But simple soil testing sets are on the market (they cost about $2.00) which any amateur can operate, provided he isn't color-blind. The sets are put through their paces by matching shades, but they require no knowledge of chemistry.

Degree of acidity or alkalinity in a soil cannot be detected by looking at it or feeling it, although an experienced gardener can tell a good deal about a soil's physical condition at a glance. The prevalence of moss, for instance, is in itself no indication of acidity. Rather, it may mean a sweet soil poorly drained. The only way to discover whether a soil is acid or alkaline or lacks some vital element, like nitrogen, is to test it chemically.

What is meant by acidity and alkalinity? These vague words are constantly repeated in garden talk. Just what do they signify? In a phrase, they mean the degree of hydrogen concentration present in a soil.

The chemical symbol for hydrogen concentration is pH. On the pH scale are 14 divisions, with pH 7 as the neutral point. Above the neutral point is alkaline; below it is acid. Every plant has a pH preference and a range of pH tolerances. Most garden plants grow well in a soil with a reaction from pH 6 to pH 8; that is, in either a definitely alkaline or a slightly acid soil. But Azaleas, for example, need a soil which tests between pH 4 and pH 5 or they're likely to sicken and die, no matter what the physical condition of the soil may be. Furnished with the soil testing kits is a handbook, listing the pH preferences of a large number of plants—many more than most of us are ever likely to try to grow. By testing for a pH reading, therefore, you can tell not only whether or not your soil should be treated with lime to make it alkaline or aluminum sulphate to make it acid, but with reasonable exactitude, depending upon the type of kit employed, the pH degree to which it should be raised or lowered. After treatment, you will naturally test again to check the success of your chemical experiment.

Lime in some form, usually hydrated lime, is used to raise the soil in the pH scale; that is, to make it less acid or to bring it up to the alkaline side. Incidentally, wood ashes and bonemeal contain lime so that these products should not be used around ericaceous plants or others with an aversion to lime. Aluminum sulphate is generally employed to lower soil in the pH scale; that is, to make it acid. Other acidifying agents are acid peat moss (the sphagnum peat on sale everywhere, but not Florida Humus which is alkaline, contains a high percentage of nitrogen and is a splendid conditioner, too), tannic acid, pine and hemlock needles, hardwood leaves, especially oak leaves.

Aluminum sulphate is powerful; a little goes a long way. A pound and a half to 100 square feet is the average dose.

The principal use for acid-makers in the average garden is for special beds to accommodate Azaleas, Rhododendrons, Laurels, Leucothoës and other woodsy plants. An acid bed need not be deep; for broad-leaved evergreens are shallow-rooting, in fact they should be mulched with oak leaves or peat moss and not cultivated. One way to make a good acid bed is as follows: Dig out the assigned area to a depth of 16 inches. Fill the bottom 8 inches with cinders, both for drainage and to prevent earthworms from altering the bed's acidity by bringing up from below it large quantities of alkaline soil. Fill up the final 8 inches with a 50-50 mixture of sandy loam and acid peat moss. If the peat moss is soaked before making the combination, it will be easier to handle. Check the degree of acidity and correct, if necessary, with aluminum sulphate.

Apart from pH reactions, one sometimes wishes to know whether his soil is deficient in nitrogen, phosphorus, potash or one of the lesser elements. For discovering such missing elements test kits are available (the Simplex outfit is a good one, retailing for about $1.00) and they may be very helpful in drawing up an intelligently corrective fertilizing program.

When to fertilize is a question the ambitious grower naturally rises to inquire. When do you feed plants? When do you add humus? When do you dig deep?

Feeding and cultivation go hand-in-hand. You cannot very well separate the one from the other, for plant food is of little benefit unless it is thoroughly mixed with the soil. In general, however, questions relating to the three short rules of soil management may be answered in this fashion: The time to *dig deep* is when making or remaking a bed; when shifting or dividing perennials, possibly in early spring but more likely in September and October; or any convenient time when growth will not be interrupted or plant life endangered or the soil structure weakened. (The moment to work soil is when it crumbles readily and this will vary with soils of different textures.) Annual beds, or space in mixed borders devoted to annuals, should be dug over to a depth of from

6 to 8 inches and enriched each spring. Perennials, since they remain in one spot longer, need a more carefully prepared soil; and the opportunity for deep digging will be less frequent and usually in the fall, when crowns are being divided or the bed, or a portion of it, is being overhauled—at intervals, usually, of from three to five years.

On the other hand, light digging—the stirring of the top inch or so which we call cultivation—starts with spring growth and is repeated as often as may be necessary to keep the top of the bed loose and fluffy. A peat-moss mulch, or something similar, may substitute for cultivation as the season advances. The top of a bed should never be allowed to pack hard; and, by the same token, a properly maintained bed or border will have few, if any, weeds. They're either uprooted before they're an inch tall, while they're vulnerable; or they are smothered under peat moss and don't germinate. Cultivation follows rain or artificial irrigation to conserve the moisture supply. It thus follows no definite time schedule, but probably averages twice a month. With good soil and good tools, such as the Gardex weeders and pull-hoes (available at most good stores or through Gardex, Inc., Michigan City, Indiana), border cultivation becomes a simple and speedy task.

Clay soil, it should be noted, has a peculiarity not shared by other soil types. It should never be worked when wet. If that is done in most soils, lumps will be formed. In a clay soil, these lumps will last for a whole season or even longer. Neither should clay soil be allowed to dry out, lest it become too brick-like to work at all. There is a point between wetness and dryness when clay soil crumbles nicely and can be cultivated almost as readily as a sandy loam; and, of course, the addition of sand and humus will help to put it in what the farmers call "good heart."

The time to add *humus* is whenever it is convenient, for it cannot harm plants. Often, peat moss is put on a bed in winter, partly as a conditioner and partly as winter protection. By spring, most of it seems to have disappeared and the improvement in the texture of the soil, apparent at the first spring forking over, is astonishing.

The time to *feed* plants is during growth periods: heavy breakfast, moderate lunch, light supper and nothing during a dormant period. In general, therefore, apply Vigoro, or some other good balanced plant food, just as plants are waking up from a winter's rest. (One well-known gardener applies such compounds on top of the mulch *before* growth starts in spring, in February or March, and does not have to worry, he claims, about foliage or stems being burned by contact. It sounds like a good scheme.) Another meal may be served in from 6 to 8 weeks after the first, although my personal preference is to give perennials a spring tonic of quick-acting inorganic fertilizer in late March or early April; another in mid-May, invariably organic (such as Driconure or shredded cattle manure and superphosphate); perhaps a top-dressing of peat moss or compost late in June, but no fertilizer of any kind, organic or inorganic, after August 15. Individual plants—chrysanthemums, for example, if extra large blooms are wanted—may be fed a bit. But perennials prepare to weather through winter much better, when both feeding and cultivation are slowed down in late summer. Annuals, on the other hand, are likely to be served with cocktails of quick stuff—a teaspoonful to a plant of 4-12-4 or 5-8-7 or any reliable formula—every six to eight weeks. They don't have to make ready for cold weather, of course; and they might as well be kept going full tilt until frost catches them.

Compost was mentioned casually in the preceding paragraph, but to dismiss it with such brevity is shortsighted. Homemade, of materials frequently burned and wasted, a compost pile is a money saver and altogether a most valuable garden adjunct.

To compost means, literally, to mix. Thus the compost heap, or pit, produces a mixture of plant rubbish—leaves, hay, grass clippings, bits of sod, garbage or any vegetative refuse which does not contain weed seeds and is not diseased—with soil, water and chemicals. When completely decomposed and screened, a soft, black "dirt" results, which can be applied beneficially at any time to any soil. In many respects, it is similar to commercial humus, or leafmold.

Waste may be stored in any way that's convenient: in a pit, a crate, a big box of hardware cloth, or simply in a heap flattened on top to help catch and hold rain. The material is put down in layers—coarse stuff, 8 to 10 inches deep; fine materials, 3 or 4 inches deep. Most seedstores carry Adco, a commercial product hastening the breakdown process; or a combination of any good commercial fertilizer with ground limestone (a pound of limestone to two pounds of fertilizer) may be sprinkled on each layer—roughly, a handful of the mixture of chemicals to each wheelbarrow of trash. Water the refuse after sprinkling on chemicals, cover with soil, and you're ready for the next layer. Build the flattened mound as high as seems practical—three to four feet is the usual practice; add superphosphate or more chemicals if odor or insects are objectionable; and fork over the pile every other month during pleasant weather, say three times between May and November at least. In from three to twelve months, depending mainly upon the character of material collected, the compost will be fit for use.

In some localities, it is possible to buy by the bag or by the ton a very fine compost, spent mushroom soil, screened and ready for the garden. This by-product of commercial mushroom growing is a mixture of stable manure and loam. By the time it reaches the flower grower, it's no less than a year old, completely rotted, spongy and virtually weedless. With conspicuous success I have used it—just as it comes with nothing added—in growing annuals and water lilies, for potting, for window and terrace boxes and for top-dressing perennials. Prices vary enormously. In some parts of the country I have bought it at $8.00 a ton; in others, at $40.00.

Watering by hose or sprinkler is a necessity in most gardens, particularly for lawn maintenance; and a warning word is not amiss. If you start it, you must keep it up.

The chief reason for making sure of sound under-drainage and for working garden soil deeply is to lower the natural water table and thus induce plants to root deeply. When established plants are deeply rooted, relatively little artificial irrigation is needed. Should plant health demand watering, however, take pains to do a thorough job or you may cause more harm than good. Imitate a rain. Allow the sprinkler to operate for several hours in one spot, and use it before 10 o'clock in the morning or after 3 in the afternoon until dusk. Set a straight-sided glass halfway from center to circumference of your sprinkling circle (to reach an average distribution) and measure your "rainfall." Permit a half-inch fall to each watered area. There are devices for watering soil without wetting leaves and these might be considered if many of your plants are subject to mildew—phlox and zinnia, for examples.

The main thing, however, is to give plenty, if you give at all. Don't sprinkle. Soak!

Summary of Chapter III: *The urge to dig is amply justified. In well-prepared soil may be grown with minimum effort the healthiest garden plants.*

Soils vary in color and texture. But all good soils contain: soil grains; organic matter; bacteria; soil solution; soil atmosphere. Ideal border soil, absent in nature, is manufactured by man through addition of chemicals and large quantities of decaying organic matter, such as dungs and leafmold, to natural loam. Under average conditions, good garden soil may be developed by following three short rules: 1. Dig deep; 2. Add humus; 3. Feed plants.

A flower bed's architecture is important. Good under-drainage and mellow soil induce deep-rooting; mulched or cultivated surface preserves soil moisture. Sometimes, topsoil must be purchased.

More often, better results will be secured by trenching, or double-digging, the soil at hand and conditioning with Driconure, cow manure and bonemeal, or similar organic substances.

Lime is useful and dangerous, too. A test should precede application. Chemical condition of soil cannot be determined by feel or observation, but only by chemical test. Tests, revealing shortage of elements or acidity or alkalinity of soil, may be made by experiment stations, seed houses, or amateurs. Degree of acidity (pH) is important to plants, particularly members of the Heath family used in gardens. Hydrated lime is most often used to make soil alkaline, or sweet; aluminum sulphate, to make soil acid.

Feed and cultivate during growth periods. Slow down as fall approaches. Add humus any time. Spent mushroom soil is a fine compost, screened and ready for use. But money can be saved by making your own compost, a mixture of decomposed garden refuse, soil and chemicals. Artificial watering often must be resorted to; but, if you start, you must continue. Never sprinkle established plants lightly. If you water them at all, soak them.

CHAPTER IV

THE CARE AND FEEDING OF LAWNS

The Ten Commandments for Good Lawns; How and When to Make a New Lawn; How to Remake an Old One; How to Maintain and Improve It; Differences between Bent and Bluegrass; Shady Lawns and Ground Covers; Summary.

A good lawn, of all garden features, is perhaps the most engaging. Not only are its verdant stretches restful in the extreme—particularly when relieved by the shade patterns of judiciously selected trees—but the lawn tends to draw into harmonious unity borders and shrub groups and tree forms and all the various components of a landscape scheme. Still, a first-rate greensward is no mean achievement. Good lawns demand good soil, good seed, good food, good care.

Most difficulties, I suspect, derive from failure to apprehend completely the fact that a lawn is an earth bed in which grow thousands of perennial plants. Because clipped grass presents an almost woven appearance suggesting a green carpet, one may be tricked into contemplating the lawn as though it were a single entity, like a tree or a shrub. Nothing could be farther from reality. A lawn partakes of the nature of a perennial border much more than it does of a woody or herbaceous specimen. If we reckon crowns to be an inch apart, an average-sized lawn of 5,000 square feet is composed of no less than 720,000 individual plants, each struggling for its share of sun and air and water and food.

Suppose lawns were unheard of. Suppose, then, that somebody gave you for your plant collection a strange herb, known as *Poa pratensis*. Just think what tender concern that lonely example of Kentucky Bluegrass would elicit! (I daresay it wouldn't long remain lonely, for the aggressiveness of Bluegrass is one of its many virtues.) However, thus fancifully to point the difference in treatment vouchsafed a border plant and a lawn plant serves to emphasize the relative neglect to which turf grasses all too frequently are subjected.

The perennial, sod-forming grasses are vigorous creatures. Even when their wants are scandalously disregarded, they manage to make some sort of show. With moderate co-operation on the part of the gardener, they will establish not perfect lawns, perhaps, but far better ones than ordinarily are on view. Common-sense general rules for lawn planting and care aren't hard to follow. As a convenient ten commandments, they might be briefed as follows:

1. Fork over the soil to a depth of 6, preferably 10, inches. Remove sticks and stones. Insure adequate under-drainage.

2. Add manure, humus, plant food (10-6-4), and work thoroughly into soil. Prepare seed bed at least as carefully as you would for annual flowers.

3. Roll; then roll again at right angles. Cross-rolling reveals low spots, where water would collect, so fill and level them; then pulverize top inch of entire surface.

4. Sow evenly a mixture, suited to situation and climate, of the best grade of seed obtainable. Don't be penny-wise and pound-foolish about grass seed. If in doubt as to mixture, consult reliable seedsmen or your state experiment station.

5. Cover seed by light raking in one direction; then roll again.

6. When grass is 2 to 3 inches high, cut with sharp mower to 1½ inches. Roll. If sowing is made in fall, you may roll once more and not cut until following spring. During growing season cut back to 1½ inches whenever growth reaches 2 inches. Stop mowing about six weeks before freezing weather.

7. Scratch surface, feed, and reseed thin spots in March or September or any time they're noticed.

8. Roll in spring and after reseeding.

9. Feed with 10-6-4 in April and September; feed shady lawns in June, additionally. Top-dress with peat moss, leafmold, or compost in fall.

10. If rainfall is insufficient and you must water, don't sprinkle. Soak!

Exceptions to rules, of course, are inevitable. We shall point out some of them as we go along, in particular when we discuss Bentgrass (*Agrostis*). The above ten rules apply primarily to lawns composed of Bluegrass (*Poa*) mixtures. These constitute the vast majority.

In making new lawns the wisest first step, I submit, is a soil analysis. Does your soil need lime? Is it shy on nitrogen? Tests run by yourself with a home gardener's kit, or a soil report furnished by your state experiment station or a reliable seedsman will diminish guesswork.

One well-known firm which offers free analysis of soil samples is O. M. Scott & Sons Company. Should you wish to avail yourself of their service, check with your postoffice whether you should send your sample to Marysville, Ohio, or to 629 Grove Street, Jersey City, N. J. For the Department of Agriculture, to prevent spread of the Japanese beetle, bans soil shipments from infested areas into uninfested territory. A pound of soil, taken from the top six inches of various parts of your plot and mixed together, makes up a proper sample.

After a soil report has been received and corrective measures have been taken to put the earth into reasonable condition, the question arises as to the best time for sowing. There *is* a best time. It's true grass can be sown any time with assurance that a certain percentage of seed will germinate. Also, good results may be secured by sowing early in spring and I *do* mean early—as soon as soil can be worked; or sooner while frost is cracking, or honeycombing, the ground. But a far better stand with far better life expectancy may be obtained in most parts of the country by sowing between August 15 and October 1.

This is perfectly logical. In early fall, the weather is cool; rains are gentle and evenly spaced; and weeds have lost some of their early-summer pugnacity. The soil, for the most part, is warmer than the air. Consequently, the young plants tend to put out roots and to stool—that is to send out new shoots from the lower joints—rather more than to make top growth. By the following spring the grasses will be in a position to respond to feeding at the start of growth, to get a jump on weed seeds and to crowd out those which might germinate. Two different plants can't grow in an identical spot. Annual weeds can be controlled largely by cutting to prevent seeding; perennial weeds can be dug out and the holes left can be filled with a mixture of good soil and grass seed. But, after all, there's only one conclusive answer to weed control: *more grass.*

Seed may be sown by hand on a calm day, sowing first north and south, then east and west—4 to 6 pounds per 1,000 square feet. A faster and more even distribution is assured, however, by the use of a small mechanical seeder, such as Scott's Lawn Master or a Vigoro Spreader. No matter what name they're sold under, there's very little difference in such devices and most seed houses carry good ones ranging in price from $5.00 to $20.00. For feeding as well as seeding, a mechanical spreader of a size in keeping with your place proves a sound long-pull investment.

No reference has been made to sprinkling at seeding time simply because watering usually will be unnecessary when seeding is carried on in fall or in very early spring. Late spring sowings often do require artificial irrigation; yet late spring sowings can't be recommended unless they're unavoidable. Lawns sown late, say in May—especially when topsoil has been brought in or stable manure has been used in preparing the seed bed—

are almost certain to yield a superior crop of Crab grass. This widespread and troublesome annual, *Eleusine indica* or related species generally, is a pest of the first water. Its seeds are present in practically all soils and abundantly in stable manure. The fact that fall sowings lessen difficulties from Crab grass alone is sufficient proof of the superiority of September lawn making.

Remaking an old lawn, provided the soil is in fair physical condition, is often a matter of feeding, watering and proper mowing rather than of plowing up the shabby turf and starting anew.

Again, a sound first step is soil analysis. On the basis of tests, a long-range liming and fertilizing program may be worked out. Perhaps the best time to attempt rehabilitation is late August so that your property won't be torn up during too much of the outdoor season.

We might go about the job this way: Cut the grass close to expose weeds, particularly perennial ones like dock and plantain. With an iron rake, scratch the soil vigorously to remove weeds and dead grass and to aerate and loosen the top inch or so. Dig out weeds missed in raking. Now add fertilizer and, for best results, an inch of topsoil. Sow grass seed, half the quantity recommended for new lawns which, usually, means 2 to 3 pounds per 1,000 square feet. Rake in one direction; then roll. Improvement should be noticeable within a few weeks, and marked by the following spring.

On occasion, the original seed bed has been prepared so inadequately that, for lasting effect, there's no alternative to rebuilding the lawn entirely. I once undertook to restore a small, ancient lawn, dominated by a huge but high-branching oak tree. To record the steps necessary to achieve decent grass may be illuminating.

The soil, in this case, was clay mingled with gravel. It needed both lightening and enriching. Fortunately, space permitted the employment of a team. The area—approximately 4,000 square feet—was consequently first plowed to a depth of from 6 to 10 inches. Next, it was dressed with a two-inch layer of thoroughly rotted stable manure. Had good manure not been available, peat moss or shredded cattle manure or sheep manure would have served very well in its place. With a spring tooth harrow, the manure was worked into the soil which, subsequently, was made fine and as level as possible with a stone drag. Because so many weeds had been on hand at the start, the land was allowed to lie fallow through the summer and was rolled and worked with a hand cultivator several times. In September, approximately two inches of topsoil were spread; a dressing of commercial fertilizer (4 pounds to 100 square feet, according to the manufacturer's directions) was cultivated in; the area was sowed with a shade mixture and finally rolled. An encouraging stand of good grass resulted.

The bill for this particular series of operations came to $130.00, or $.0325 a square foot. Expense was greater than usual, due chiefly to an excessive price for local topsoil. Ordinarily, a new lawn can be made or an old one can be completely revamped at a unit cost of $.02 a square foot.

Proper lawn maintenance is quite as necessary to the growth of strong, healthy turf as careful preparation of the seed bed, or sowing with the best grade of recleaned, relatively weed-free grass seed.

In order of importance, principal activities carried on under the general head of maintenance are:

1. Feeding
2. Mowing
3. Sprinkling.

Now, let's consider each of them somewhat in detail.

First, clippings alone cannot be relied upon to feed grasses. To some extent, elements withdrawn by grass plants are returned to the soil when clippings are allowed to remain where they fall. Unless they are too long, they are quickly shriveled by the sun, drop to the roots of the plants where they form a mulch, and in the course of time disintegrate. Thus they contribute humus and some food to the earth.

However, not only is a crop harvested every time a lawn is mowed but a certain amount of food is leached out by rains. There must, therefore, be a small but persistent deterioration of the soil. To compensate for such losses, to keep the soil productive (just as a perennial flower bed must be maintained at better-than-average fertility), a lawn should be fed twice a year or three times a year if in shade. Studies conducted by experiment stations leave little doubt that a 10-6-4 formula is best for lawns. Obviously, a high nitrogen compound is indicated; for in grasses we seek a lush, green growth rather than strength of stem or prolific seeding. Scott's Turf Builder (stocked by most garden supply stores or purchasable direct from O. M. Scott & Sons Co., Marysville, Ohio) is an excellent grass food; and other good brands are available. First-rate results, according to my personal experience, have followed a March application of granulated peat moss and barnyard manure (3-1-1); a second application of the same in late May; and a final fall dressing of peat moss and cow manure (1-1-1), chosen because it was low in nitrogen and wouldn't be inclined to overstimulate close to the onset of freezing weather.

The important thing is not so much which one of many reliable compounds we employ as it is that we do, systematically, feed our hungry lawns. Nature abhors waste spaces. As they occur, she covers them—generally, with plants we don't want and therefore call weeds. Well-fed grass decreases the likelihood of bare spots. Given a wholesome diet (and properly mowed), grasses will tiller out; that is, spread and demand more earth space.

Second, mowing has a great deal to do with the stooling, or spreading, of turf grasses. Left uncut, most lawn grasses become hay—tall, thin tufts surmounted by seed-bearing stalks. Lawns should never be allowed to go to seed; nor, indeed, to grow more than 3 inches tall at the most. At the same time, Bluegrass (the basis of most lawn mixtures) should not be cropped too close. The average lawn mower, when it's sold to you or comes back from the repair shop, is set to cut about half an inch above soil level. This is all right for Bent, but not for Bluegrass. The stalk of the latter divides and forms its leaves fairly high above ground. Since we know green blades play a vital part in manufacturing food and that vigorous root growth (and hence durability) cannot take place without corresponding top growth, we must allow as much top growth as possible, consistent with avoidance of tuftiness. In short, a compromise must be effected between clipping to stimulate spreading from the crown and not clipping so as to permit leaf production. This compromise point is 1½ to 2 inches.

To set a machine to cut at this height in most cases means lowering the wooden roller as far as possible. Sometimes, in older mowers, it's necessary to have longer roller brackets made than those with which the machine originally was equipped, or to replace the wooden roller with one of larger diameter. Adjustments are well worth while. They may be a little troublesome on older types; though on such new models as the light-weight Clemson, which was impressively demonstrated at a recent International Flower Show, they're easily made without even a wrench.

Most lawns are cut on the same day each week. This may be, of course, the only practical way of getting the work done. However, when the owner trims his own small lawn, it may be wise to abandon fixed routine and to mow in accordance with the rate of growth: frequently in spring and fall, infrequently in summer. First, cut to 1½ inches after a little spring growth has been allowed for replenishing root systems. Thereafter cut whenever the grass reaches a height of 2 inches, no matter what day of the week it happens to be. Provided the mower be good and sharp, the grasses of a small lawn can be topped in a fairly short time; and the irregular schedule, therefore, is likely to lessen rather than increase the labor of mowing. From the standpoint of lawn health, the program will prove highly beneficial.

Third, correct watering is inducive to sound growth of grasses; incorrect watering is not. When soil is reasonably good and lawns well-fed, little, if any, artificial irrigation need be resorted to in normal weather. If the lawn is to remain green during dry spells, however, water usually must be given. One good soaking a week is generally sufficient; a half-inch of "rainfall," perhaps, as suggested in Chapter III. Repeated light sprinklings are definitely injurious to turf. They bring the roots to the surface in search of moisture instead of persuading them to root deeply, as they should. The subsoil—not the topsoil—should be full of water.

Creeping Bent lawns may be extraordinarily beautiful. On that point, there's not a shadow of a doubt. But they require a good deal more care and attention than lawns in which Bluegrass predominates; nor, because of their inability to withstand summer heat, are they practical south of the Mason and Dixon line.

Perhaps the simplest way to make clear the differences between the Bentgrasses and the Bluegrasses is to draw up a table of comparative requirements. Let's try it.

Soil—For Bent: At least 6 inches of rich loam over a sandy subsoil. Under-drainage should be practically perfect; the seed bed reasonably level; the situation fairly sunny. An acid soil is best—preference about pH 5.3.

For Bluegrass: Average good soil 4 to 6 inches deep with average drainage. Seed bed may be flat or sloping. Does well in light shade, while mixtures in which *Poa trivialis* is predominant (a type of grass closely related and similar in appearance to Kentucky Bluegrass) may make respectable turf in quite heavy shade. Soil should be alkaline—preference about pH 7.5. Because of differences in chemical preferences, combinations of Bent and Bluegrass or Bent and Clover cannot be ideal. Grass mixtures are preferred to single strains, however, both for health and for fresh appearance of lawn due to varying periods of efficiency in different grass types.

Feeding—For Bent: Feed once a month during growing season with 10-6-4, or special formula for putting greens, or other reliable fertilizer. Due to creeping and surface rooting, addition of compost in fall is important.

For Bluegrass: Feed twice a year, March and September; three times a year in shady places.

ROLLING—For Bent: Roll not less than once a month during growing season.

For Bluegrass: Roll in spring to correct slight irregularities in surface and to press roots, disturbed by frost action, into intimate contact with soil particles. Subsequent rolling helpful but not vital.

MOWING—For Bent: Since most of the species considered desirable as lawn grasses are stoloniferous (that is, produce prostrate branches which root) and relatively dwarf, close cutting is required. To keep height of grass at around ½ inch usually involves mowing twice a week. The plants grow very close together and clippings are therefore inclined to mat. They should be gathered up in a grass catcher for addition to the compost pile.

For Bluegrass: Average mowing intervals for lawns maintained at height of from 1½ to 2 inches is 8 to 10 days. Clippings less than an inch long may usually remain where they fall. If still noticeable a day after mowing, only such piles as are in evidence need be removed.

WATERING—For Bent: Soil in which Creeping Bent is growing should never completely dry out, lest thereby the grass be killed. Watering with a fine spray is necessary two or three times a week; in hot weather, perhaps daily.

For Bluegrass: Little, if any, watering normally required on average good soil. Bluegrass can recover from quite severe parching.

It is evident from the foregoing that Bluegrass not only may succeed under limitations too drastic for Bent but that Bentgrass lawns, even under the most favorable conditions, are temperamental and demanding. Nevertheless, when proper cultural care is possible, they often are worth all they cost. The creeping habit tends to heal over turf wounds. The acid soil they like, which lawn weeds in general dislike, discourages undesirable, wind-sown visitors. Bright green, smooth, weedless, soft and thick as the deep pile of a fine rug, nothing can surpass well-grown Bentgrasses in producing a true *tapis vert*.

In shady areas a good turf often may be achieved by the use of special seed mixtures, built as a rule around Rough-stalked Meadow Grass (*Poa trivialis*). Yet, here and there, handicaps in some gardens defeat the shrewdest efforts to establish a lawn. Shade may be the cause for failure. More often, poor drainage or root competition prevents permanent grass. Beneath a Norway Maple, for instance, Herculean laboring may have little effect, although Bugleweed (*Ajuga reptans*) sometimes can gain a foothold.

By and large, obstinate spots in the shade of houses, trees, or large shrubs, or situations which preclude the proper conditioning of the soil for lawns—such as steep, rocky slopes where mowing would demand the agility of a mountain goat anyway—would better not be sown to grass. Why be content with scraggly turf when contrary locations may be not merely coped with but frequently beautified by ground covers?

Ground cover, of course, is a very general term. Any low, massed planting may be said to be a ground cover. In common practice, though, the phrase applies to spreading or trailing perennials which, by reason of adaptability, persistence and good foliage, make a presentable appearance all season in places where grass or ordinary garden plants would probably give up the ghost. Ground covers won't submit to being walked on, however. They may take the place of grass, but they cannot be thought of as substitutes for grass. There are no satisfactory substitutes for grass.

Among various possible ground covers the following deserve special mention:

Japanese Spurge (*Pachysandra terminalis*): This spreading evergreen perennial, 6 to 8 inches high, flourishes in rich soil but manages in average soil anywhere. Practically undefeatable, even by city conditions or pine trees, it is ideal for evergreen underplanting; in fact, it accommodates itself to every degree of shade. White flowers are inconspicuous and negligible. Scale of the handsome foliage is rather large. On that account, Mountain Lover (*Pachistima Canbyi*), a foot-high evergreen shrub native to the mountains of Virginia, is sometimes substituted.

Trailing Myrtle or Periwinkle (*Vinca minor*): In certain respects, this glossy evergreen trailer surpasses Pachysandra, though its architecture is less sturdy. It grows in sun or shade, in average soil, produces pretty blue or white flowers (the white variety is rather rare but is stocked by a number of good nurseries) and combines pleasantly with Narcissi, Virginia Bluebells, Bleeding Heart, fall-flowering Plumbago larpentae (*Ceratostigma plumbaginoides*) and similar material. The myrtle called Bowles Variety has glossier leaves, larger, deeper blue flowers and more of them than the type.

Bugleweed (*Ajuga*): This hardy perennial, creeping by stolons like Bentgrass but not so rapidly, grows in sun or shade in average soil and has effective flowers. The species *Ajuga genevensis* produces light blue blossoms in May and June; while a variety, *Ajuga reptans* var. *rubra*, has dark blue flowers and purplish leaves. The latter likes shade and is perhaps, on the whole, the better ground cover.

English Ivy (*Hedera helix*): Everyone knows ivy as a vine, but not so many realize it's a wonderful ground cover, much hardier as a carpet than when climbing. The stoutest variety is the small-leaved *Hedera helix* var. *baltica*, commonly known in the trade as *gracilis* or Hardy Baltica. Ivy prefers a rather rich soil but adapts itself to the average and in shade is handsome and dignified. Northern and western exposures are best for climbing. On the ground, it rarely winter-kills in any exposure.

Violets, both the common wild violets and the sweet violets, in positions affording abundant moisture, partial shade and a light leaf mulch in winter may be naturalized and thus form lovely ground covers. Various colors are available—blue, purple, white, yellow, pink. A continuous bloomer, Rohrsbach's Perpetual (*Viola odorata semperflorens*), has recently been introduced and is said to be as easily grown as any ordinary violet.

In rich woodlands, or under similar soil and shade conditions, the fragrant blue Wild Sweet William (*Phlox divaricata*) which combines so exquisitely with pale yellow Primulae and small-cupped, light-toned Narcissi may lay an admirable spring carpet. Its foliage is scanty, although it tends to thicken when fading flowers can be removed.

In barren, sunny places either the creeping Phlox (*Phlox subulata*) or the sub-shrub Sun Rose (*Helianthemum Chamaecistus*) makes a strong ground cover. Neither one tolerates any shade. The Sun Rose is available in a number of colors—white, yellow, orange, scarlet, pink—and soon makes an agreeable evergreen mat, studded in season with little roselike flowers. The variety known as Buttercup is one of the best. It is reminiscent of Father Hugo's Rose (*Rosa Hugonis*) in miniature, though it's not a relative. Creeping phloxes, commonly called Ground Pinks or Moss Pinks, are most frequently represented by the variety *Rosea*: a pink containing too much blue for most situations, though it's effective against a gray background, a boulder, for instance. Especially attractive varieties are *alba*, Blue Hill (pale blue), Fairy (a darker blue), Lilacina (pale blue flowers, good foliage) and Vivid (bright pink). Like most phloxes, these dwarf sorts should be divided and reset every three or four years for best results.

The old-fashioned Plantain Lily (*Hosta plantaginea* or, as it's more often listed, *Funkia subcordata grandiflora*) with its fragrant white flowers in August and September is a bold and persistent perennial. In good soil and a sheltered position it can create an effective ground cover. Under large Magnolias, for example, combined with true Lilies with which it blends aptly, Hostas may paint a startlingly fine picture.

A Crested Iris native to our southern mountains, *Iris cristata,* is another altogether delightful ground cover. It grows in sun or shade, in any soil, has thin, light green spears usually about 6 inches tall, spreads rapidly and bears early in spring sweet, nicely proportioned flowers of pleasing blue. This little Iris is a superior subject; and, but for two drawbacks, would qualify as the perfect ground cover. Like all Iris, tufts of coarse grass are likely to take root among the matted rhizomes when plants remain long in one position; and, secondly, shy flowering follows too much crowding. In common with most iris types, *Iris cristata* behaves best when taken up, divided and replanted every third to fifth year.

Honeysuckle, as all of us know, will cover the most difficult terrain like lightning. At the same time, it tries to climb up and choke everything in sight. The vine is both a good ground cover and a nuisance.

Many other plants might be suggested. Yet none surpasses Pachysandra, Bugle, Myrtle and Baltic Ivy in ability to take care of themselves and to spread without interfering with the rights of other plants. These are the best all-round performers in place of sickly grass. These are the Big Four of Ground Covers.

Summary of Chapter IV: *A good lawn, valuable in integrating garden features, demands good soil, good seed, good food, good care. It must be remembered that a lawn is not a single entity but a composite of tens of thousands of individual plants.*

Common-sense rules of lawn making and lawn care may be boiled down to: 1. Prepare soil thoroughly; 2. Sow best seed obtainable; 3. Cut Bluegrass mixtures high, to average 1½ inches; 4. Feed in spring and fall; 5. If you must water, soak.

A soil analysis is an intelligent first step. And fall, in most instances, is the best time to sow a new lawn or remake an old one. Proper feeding, watering and mowing can sometimes correct a shabby turf. Vigorous grass means fewer weeds, for two plants cannot occupy an identical spot simultaneously. The only conclusive answer to weed control is more grass.

Creeping Bent lawns, impractical south of Mason and Dixon line, are unsurpassed in beauty *but demand much care. For Bent seed bed must be level, perfectly drained, not too shaded, and preferably acid. Bent should be fed and rolled once a month; mowed close, usually twice a week; watered frequently, under some conditions, daily.*

Good lawns can be achieved in certain degrees of shade, principally by use of mixtures built around Poa trivialis. On occasion ground covers are preferable. Many plants can be used as ground covers. For general purposes, four are outstanding: Pachysandra, Trailing Myrtle, Bugle, and Baltic Ivy.

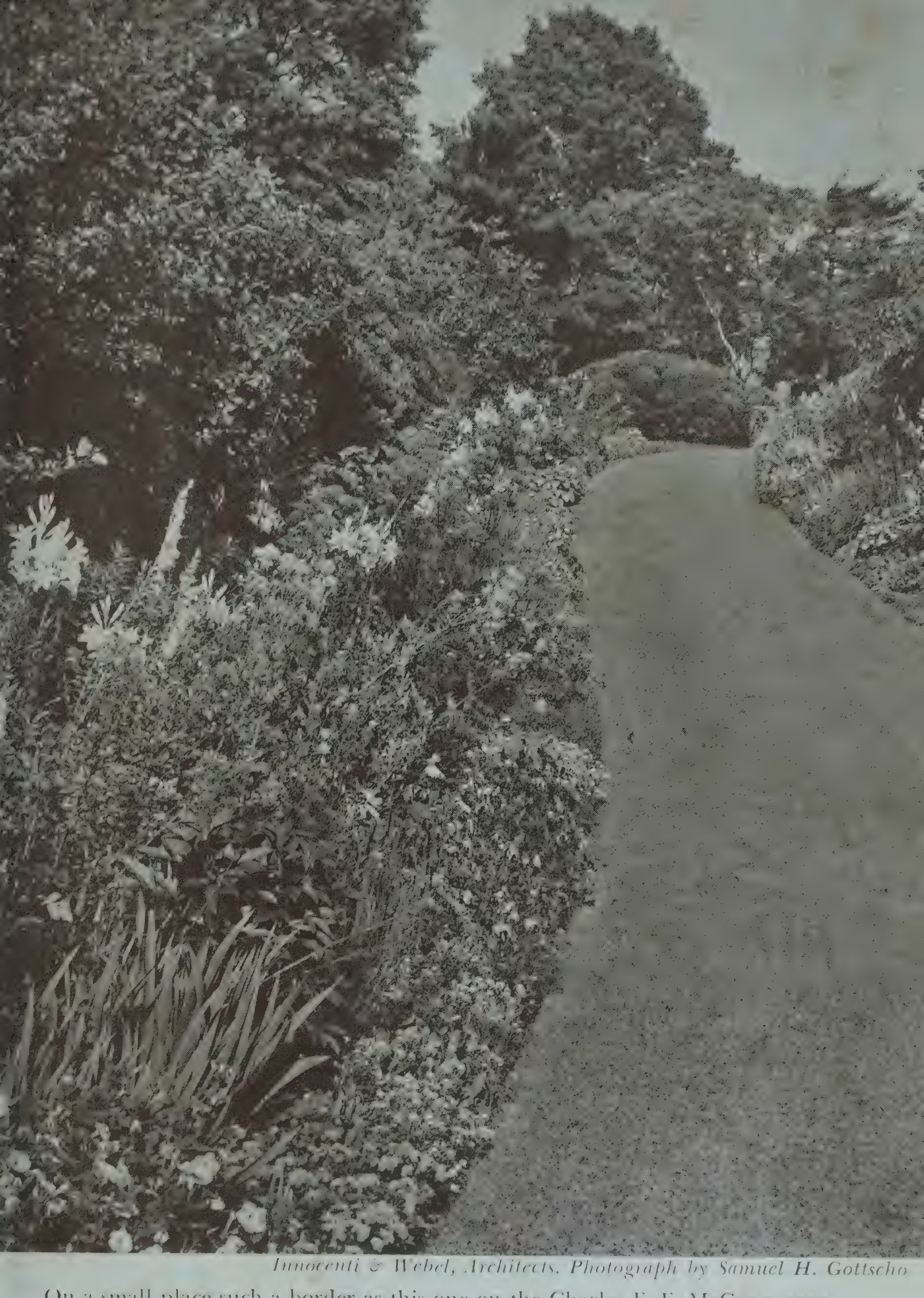
CHAPTER V

THE MIXED FLOWER BORDER

An Opportunity for Many Plants in Relatively Small Space; Use of Annuals in Conjunction with Perennials; Planning Detail around a Backbone of Hardy Stand-bys; Importance of Background—Masonry; Wooden; Hedges; Shrubs and Flowering Trees, with List of Sometimes Overlooked Desirable Subjects; How to Prevent Monotony in Hedges; Edgings; A Word or Two on Color Schemes; Summary.

The mixed border, adaptable to many types of gardens, offers variety in small space. It is the *multum in parvo* of flower gardening. Composed in the main of perennials, augmented by annuals and bulbs, and set against hedge, shrubbery, or architectural background, the successful mixed border is extremely interesting to look at and to manage. Maintenance is neither so easy as to be boring nor so difficult as to be depressing. While it's simpler to grow annuals and perennials in separate beds, small beds require more time to keep them in order than when combined in one border. Furthermore, a border of perennials, annuals and bulbs may be so made up as to convey the impression of being always in flower (since some part of it is) all the way from daffodils to chrysanthemums, without having to be nearly so wide as must be an all-perennial one in order to permit proper succession of bloom.

I don't mean to imply that a handful of annual seeds, dribbled in spring among perennials, will reward the sower by a blaze of summer glory unsurpassed by Solomon, complete with wives. Such, emphatically, is not the case. First of all, there are annuals and annuals. Some spring into sturdy being with remarkable speed. Others (like double petunias, for instance) demand sympathetic nursing in the early stages. Again, annuals



Innocenti & Webel, Architects. Photograph by Samuel H. Gottscho

On a small place such a border as this one on the Charles E. F. McCann property in Oyster Bay, Long Island, might be not one of many features but virtually the entire garden. No type of personal garden work is more consistently interesting than the management of a sound mixed border.

Courtesy Better Homes and Gardens. Photograph by Samuel H. Go

A simple place like this 1750 Salem reproduction should be planted simply; for inappropriateness is a synonym for bad taste. Note particularly the old-fashioned Lavender (*Lavandula vera* var. *compacta*) beside the vestibule door.

and perennials don't always relish the same soils. Many perennials prefer a fairly heavy loam. Fast-growing annuals want a rich, loose soil, well-drained and well-worked and well-fed. They, too, like elbow room and not too much root competition. They must be cultivated and sprayed and watered and picked regulary. Indeed, to grow them well from seed in quantity takes time, space and pains enough to give the most seasoned gardener pause.

Be that as it may, a few annuals are essential to the average garden. How they may be acquired with the least strain on the garden maker will be discussed under Chapter VII. For the present, let's confine ourselves to the satisfactory employment of annuals in conjunction with perennials.

The coupling of annuals with bulbs is neither rare nor difficult, while to plant annuals alone is no trick at all. Only when we seek to interplant herbaceous perennials with annuals do we run into genuine trouble. Ingratiating in theory, the tucking in of specimen annuals here and there in an established hardy border is unworkable in practice. An occasional potted annual may make some headway against perennial roots, but random interworthy. Both from a pictorial as well as a cultural standpoint, this means of embracing the showiness of annuals is virtually impeccable.

The best borders, by and large, are composed not of collections of single plants (though single specimens often make agreeable accents) but of groups, each consisting of from three to fifteen, dependent on size of border and of plants, specimens of one variety. And these groups are separated from each other by substantial foliage masses: plant groups which either have flowered or will flower in the future, or specimen shrubs or evergreens or small flowering trees brought in to give body or supply contrast. To prolong the border's vitality during the time of perennial color famine, some of these plant groups may advantageously be of annuals—again, preferably, with each group limited to examples of a single variety. And these annuals should be so located that perennial foliage will mask them until they're sufficiently mature to be entirely presentable.

Suppose we consider, for a moment, how such a plan might work out in detail. The edging plant of a theoretical border might be hardy Candytuft—

as neat as Boxwood, when sheared after flowering. Behind it, generous settlements of Columbines, Korean hybrid Chrysanthemums, the compact Nepeta known as Souvenir d'André Chaudron and dwarfish fall-blooming Irises (a comparatively new race, valuable not only for its two-season flowering tendency but for its good all-season foliage) might erect a dependable, low mask. No matter what went on behind this screen, the border would present a neat face to visitors. In the middle ground, Peonies flanked by Veronicas, Day-lilies and tall Bearded Irises, let us say, might divide the border into bays from eight to fifteen feet in length, depending upon the overall border dimensions. To the rear of the Peonies, Hardy Phloxes, False Dragonheads, hybrid Delphiniums, Hollyhocks (short-lived perennials, frequently grown as biennials) and other tall perennials would find their places in front of fence, wall, shrubs, or whatever served as the border background. (Incidentally, with the exception of Hollyhocks, Snapdragons and Pansies, few biennials can be recommended for the average border, unless you're prepared to replace them after flowering with well-developed potted plants grown for the purpose.)

In such a border, ideal locations for annuals are two in number: first, between foreground plants and Peonies, for low annuals; second, between Peonies and Phlox plantations, for tall annuals. The areas given over to annuals should be narrow drifts from a foot to a foot and a half wide and from eight to twelve feet long, according to border scale. Nor should there be too many of them. Too many will crowd the scene, just as a magazine page with too many halftones loses effectiveness through superfluity of illustration. Early in the season these spaces reserved for annuals will be bare (or their edges may be planted to bulbs). Later, they'll be filled with small plants. In no case will it prove disturbing, for the sound foliage of foreground plants will insure for the border a constantly trim appearance. When annuals are tall enough to show above foreground foliage, most of them will be in flower and all of them will be agreeable to the eye.

Furthermore, this method of fetching annuals into the hardy border doesn't break faith with horticulture. The annual areas, since they're relatively large, can be dug over in spring as they should be without danger to perennial roots or crowns. Presumably, all the soil in the border will have been well-conditioned in accordance with the practices described in Chapter III; but the annual areas can be further lightened, if need be, with sand or ashes or peat moss. They can be dressed with quickly available plant food. And the seedlings, themselves, can be properly spaced. With room to grow, soil prepared to their liking and plant food to nourish them, the flowers can do themselves justice and therefore lay soothing unction upon the grower's conscience.

To plan border detail on paper is both simple and advantageous. A border, say 10 feet wide and 50 feet long, will contain 500 to 600 plants in addition to bulbs. To remember over a winter just where all of them are is astonishingly difficult, unless you have a camera eye and an elephant's brain. For future as well as advance planning, a record is advisable.

In any store selling draftsmen's supplies, graph paper may be procured. Plotting sheets divided into one-inch squares will be found very convenient. If a soft pencil is used, changes and corrections are easily made. Various cross-hatches may indicate seasons; colored crayons help determine the color scheme; a line around each plant group shows its relation to other groups.

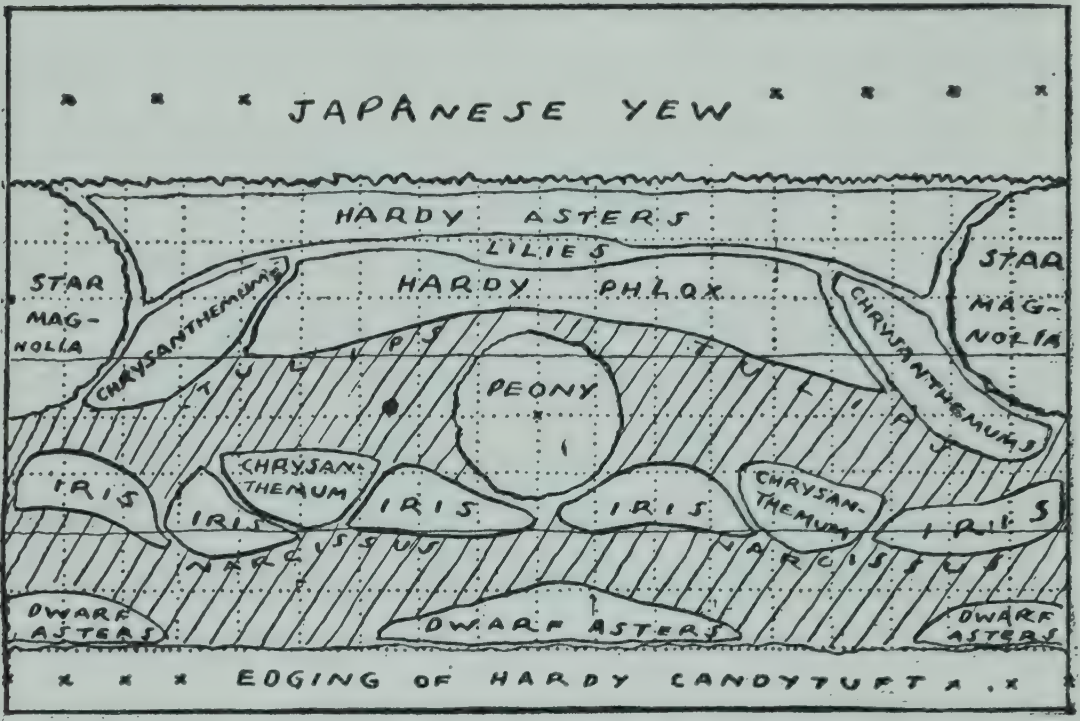
The all-perennial border, to allow room for enough plants to make possible a more or less continuous succession of bloom, must be quite wide—12 feet to 15 feet at least. Consequently, it would probably be out of scale in a small garden. The mixed border, however, can be much narrower and still be effective: 5 feet to 9 feet wide, perhaps. Incidentally, don't worry unduly about walking into the border when cultivating. One quickly learns to stand in certain spots where no harm will be done; or, almost without thinking, to loosen soil after stepping on it.

In planning, we think of the border as divided into strips: edging, foreground, middle ground, rear strip, background. Thus in a 9-foot border (a desirable width, frequently practical on small places) the approximate allowance for width of each strip might be as follows: edging, 1 foot; foreground, 2 feet; middle ground, 3 feet; rear strip, 3 feet. In addition, background width must be calculated. Let's say we are using clipped Hicks's Yew trimmed to a height of 6 feet. For the background, then, we'll allow a width of 2 feet, or a total for border proper and background of 11 feet. If you're accustomed to thinking in terms of window boxes and 4-foot beds, this may strike you as wide. It isn't, though; nor will you feel it to be by the time plants are established in it. Proportions are sound and from a working standpoint it's practical. When length can be 50 to 75 feet this border will be found, I think, almost ideal for small place owners who like to do their own garden work. About 8 hours a week—provided soil has been put into proper condition—will keep it in apple-pie order; and most of that can be accomplished as week-end exercise.

Now, in actual planting great care should be taken not to plant in rows. Those strips are for convenience in planning and estimating. But in planting it should be borne in mind that the border will be viewed from different angles at different times and, therefore, tall plants should be brought forward now and then, and groups of lower plants should occasionally drift backward. As you put the border down on paper, try to visualize it. Think of foliage effect and foliage contrast first, color of blossom second. Allow plenty of space between plants for future growth, for pleasing pictures to a considerable extent are insured by healthy development. The distance apart at which plants should be placed varies somewhat with varieties, but a good general rule is to space plants at one-half their mature height.

Because of the complication of roots, borders usually are better not placed too close to large trees, in particular maples, beeches, or willows. Shrubs which sucker extensively (such as common Lilac) must be reckoned with, too, and allowances made for their habits. Eastern, western, southern exposures—all are suitable. A northern exposure curtails perennial material and almost eliminates the use of annuals. A convenient water supply is needed. Proper soil preparation (see Chapter III) is vital. This point cannot be overemphasized.

The main plantings in practically all borders are made up of Iris, Peony, Hardy Phlox, Chrysanthemum and Hardy Aster. These are the backbone plants, the perennials which give the border mass or structural significance. If a permanent edging plant—such as dwarf Boxwood or dwarf Yew—is employed, it also contributes to what might be called the border's architecture. It is



This diagram represents the first basic step in making a plan for an 18-foot section of a typical border, nine feet wide and backed by a Yew hedge three feet wide. Three or four such sections or bays comprise the usual border. Here we see one of many ways in which the five backbone perennials—Iris, Peony, Hardy Phlox, Hardy Aster, Chrysanthemum—may be used to establish structural significance as well as seasonal mass bloom. Varieties and species are selected in accordance with individual color preferences, while from a narrower border both shrub Magnolias and tall Asters would probably be omitted. Shaded portions add diversity and interest when filled with drifts of annuals and the more delicate perennials, such as Columbine and Hemerocallis and Meadow Rue and Delphinium and Platycodon. Dotted squares simulate graph paper, a great help to speedy planning.

sound practice to build borders around varieties chosen from these five reliable genera; and then to decorate the framework thus erected with selections from such delicately wrought and contrasting subjects as Columbine and Hemerocallis and Veronica and Delphinium and Platycodon; and, of course, drifts of bulbs and annuals. In a general way, spring flowers are low; summer ones, of medium height; and fall flowers, tall. Since one doesn't plant tall flowers in front of low ones—not only for appearance but so that all plants may receive their share of sunlight—color starts at the front of the border and, as the season progresses, works toward the back. Peonies and Irises dominate the middle ground; Phlox is dictator behind and between such groups; tall Hardy Asters set the pace in the back row. But Chrysanthemums, pinched back to prevent legginess, and dwarf Hardy Asters and annuals may bring color forward in the fall, just as drifts of Tulips and the taller types of Narcissus, set near the fresh new shoots of Phlox, may carry color rearward in the spring.

A preference in border arrangement or grouping is a very personal matter, like a taste for eggplant. Therein lies the border's great fascination.

Not only do its floral pictures change with the waxing and waning of various groups, but gardeners are forever observing improvements which could be brought about; and (if they've kept their notebooks in reasonable order) are likely to be cheerfully occupied during September and October in accomplishing them.

One warning whistle might well be sounded at this point: *Don't attempt to be too precious in your effects.* You are not working with cut flowers but with living plants, you know. Dry spells and sudden thunder storms and active children and excited pets and other blights and bugs can smash a too delicate border picture before you can say *"Clematis Jackmanii."* Broad, bold strokes have a good chance of surviving the vicissitudes of life outdoors. Save your poetic fragility for arrangements inside the house.

The border background, as you may have noticed a few paragraphs back, was listed as one of the five border divisions: edging, foreground, middle ground, rear strip, *background.* This is as it should be. Since a border is a bed on the outer boundary of a garden, it cannot be divorced from its background and, indeed, should not be conceived without it. Flowers do not show up well without a backdrop any more than undefined gardens achieve unity. Without the consolidation of substantial planting or structure back of the border, the flower display is vague, disembodied, meaningless. More than any other element, with the possible exception of a lawn under certain conditions, the background draws together and harmonizes the various landscape components.

Backgrounds are of four general types: masonry, wooden, hedge, and shrub-and-tree. Personal liking controls the selection, of course; but choice should be greatly influenced by the architecture of the house and the style of garden projected.

Apart from such considerations, each background has special qualities. Suppose we examine them briefly.

Masonry: Walls of old brick or new brick painted white or whitewashed, thick shale or flagstone (like Pennsylvania bluestone), field stone or rubble stone, concrete painted white and coped with cut stone—all make splendid backgrounds. They need little space; they protect from drying winds; they reflect the sun's rays and benefit plants. But they're expensive to build. Depreciation, on the other hand, is slow; and maintenance cost is consequently modest. Best of all, walls (and fences as well) set up no root problems. The general effect of masonry is dignified and more or less formal.

While walls may retain a bank or be free standing, proportion between width of border and height of background is important. A too low wall may suggest curbstones; a too tall one will be topheavy. A pierced wall, lighter in feeling than solid brick, may be relatively taller. Broadly speaking, an agreeable ratio is 3 to 2: a border 9 feet wide, for example, may be backed by a 6-foot wall.

Wooden: Backgrounds of wood, such as picket or plank or (for rural homes) post-and-rail fences, properly erected wattles—usually of chestnut saplings—and lattice may be excellent. They are neat and orderly and informal in varying degree. None is particularly costly. All types are very economical of space for none is more than a few inches thick. Open sorts are inadequate, however, unless evergreens or shrubs or both are planted behind them. If this is done in the case of picket fencing—Chinese

Lilacs or Forsythias or Japanese Quinces, for instance—a better garden frame for the simpler Colonial architectural styles can scarcely be devised.

Wattle fences don't have to be painted, fade out to a pleasing silvery gray and, when regularity is relieved by an occasional vine or shrub, form competent and attractive screens.

Lattice calls for caution. There's grave danger of making it too conspicuous, too fancy. When well designed and well constructed and painted off-white or gray-green, however, lattice in certain situations is first-rate. It should never be slight to the point of flimsiness and, in truth, is rather more of a divisional screen than a background. An arbor, it might be added, rarely makes a completely satisfying background or termination, though it may be a most useful device for connecting one part of the grounds with another.

Hedges: Almost any shrub can be grown in a nursery row. Almost any shrub can be trimmed to form. It follows, therefore, that almost any shrub can be planted as a hedge. While many flowering shrubs and trees furnish charming informal backgrounds, comparatively few are really worth while when clipped. Several evergreens are practically perfect for this purpose. But, in my opinion, no deciduous shrub or tree rates anywhere near the hundred mark as a formal hedge.

For most of the country, there's little question that the Yews lead the formal field. Their scale is ideal for small places. For a low, wide hedge (or edging) the best is perhaps *Taxus cuspidata* var. *nana;* for a 5- to 6-foot hedge about 2 feet wide Hicks's Yew (*Taxus media Hicksi*) is unsurpassed; for a 6- to 8-foot hedge, 3 to 4 feet wide, the upright or capitate form of Japanese Yew (*Taxus cuspidata*) ranks first. Kelsey's Yew, a heavily berried form, makes an unusual hedge perhaps 5 feet tall and 4 feet wide. All the Yews, since they're slow-growing, are fairly expensive. Still, if you're patient enough to buy young plants, to set them out in a single row 1½ feet apart and wait, this drawback may be circumvented.

North of Washington, D. C., Boxwood needs winter protection, primarily from snow and ice rather than from cold. However, a hedge of old dwarf Box (*Buxus sempervirens* var. *suffruticosa*) is a dark and billowy delight. Growth is extremely slow and large plants consequently are costly. Yet no plant has more character, and it isn't surprising that people will go to great pains and expense to secure fine specimens. The common, or Tree, Box (*Buxus sempervirens*) is more open and faster growing than its famous variety.

The best tall evergreen formal hedges are made of Hemlock (*Tsuga canadensis*), placed about 1½ feet apart and sheared usually to a width of 5 or 6 feet and a height of from 8 to 12 feet.

While the evergreen hedges mentioned above are outstanding, good ones can be fashioned with Cypress, particularly Plumed Cypress (*Chamaecyparis pisifera* var. *plumosa*) or Slender Hinoki Cypress (*C. obtusa* var. *gracilis*), or with Arborvitae (*Thuja*)—the former perhaps better for the south, the latter for the north. Parenthetically, juvenile and horticultural forms of Cypress are frequently listed as *Retinospora*.

As a rule, Cypress and Arborvitae are cheaper than Yew, Hemlock or Boxwood. However, this advantage is somewhat offset by the more even growth of the latter trio. Sheared native Red Cedar (*Juniperus virginiana*) is sometimes used as a hedge, although it's better as an accent and better still as a field tree; and, when space permits, Spruce or Pine. All three of these are too big for small gardens. Because of their scale, Yew and Arborvitae and Cypress are best for small gardens.

All these evergreens, providing a living wall of green in both winter and summer, share one additional great virtue: they may be kept to form with only two shearings or prunings a year—April and August, the two annual growth periods. Best results follow when the hedge form is slightly broader at the base than at the top so as to allow light and air to reach all the branches. Don't try to control size by starvation. For even, healthy appearance, hedge plants should be well fed, should grow vigorously, and then be cut back.

Of course, it's too much to hope that hedges of clipped Privet or Barberry will suddenly disappear. After all, they cost little and grow readily under all sorts of trying conditions. But they must be trimmed three or four times a season and are of little value in winter. Far too many have been planted in the past. Not a half bad idea would be to declare a moratorium on them for the next fifty years. If you still feel they're irresistible, you might as well know that *Ligustrum amurense* is about the hardiest Privet; and that the Wayside Gardens' relatively recent *Berberis Mentorensis* and the narrower Columnberry (*B. Thunbergi pluriflora erecta*) are tremendous improvements over common Barberry. For deciduous hedges, 4 to 5 feet wide and in the neighborhood of 8 feet tall, consider Buckthorns (especially the shiny-leaved species, *Rhamnus Frangula,* which is shade-tolerant) or Hawthorns (the Cockspur Thorn, *Crataegus Crus-galli,* is one of the nicest for this purpose). They offer happy substitutes for Privet. So, for that matter, do hedges of common Lilac, Forsythia, Japanese Quince, Spirea and many other commonly planted shrubs. To sacrifice both flowers and the natural shape of the bush to strict hedge form, however, seems rather a pity.

Shrubs and flowering trees: When there's room, a perfectly delightful background may be worked out with a mixture of flowering shrubs and trees and conifers. For a genuine shrub border, one needs a width of from 15 to 20 feet and rarely can a small place afford that much land. However, an informal hedge, simply pruned back after flowering and perhaps terminated by shrub and tree groups in the corners of the plot, often may be developed into a handsome and unhackneyed background for flowers. Between shrub line and the flower border proper, it's well to leave a service path—say, two feet wide—not only to give access to the shrubs but to prevent roots from encroaching too much on the perennials; or, a sunken wall of concrete or sheet metal may prevent invasion. For a while, annual root-pruning of shrubs may work. This practice eventually will intensify instead of solve the problem.

On a small place especially, one should avoid a heterogeneous plantation of shrubs. Select, rather, a "theme shrub" which may be relieved and complemented by other species—a total, possibly, of from five to seven types. In my Long Island garden, for example, the dominant shrub is common Purple Lilac. Everywhere you look, you see one. The house is ancient and the keynote of the garden is "old-fashioned tranquillity" which the Lilacs sound persistently. In order that the effect may not be monotonous, however, the Lilacs are interplanted with Sweetshrubs and Bridalwreaths and Mock Oranges and other ingenuous old friends. Care has been taken, too, to give the shrub masses definite form. The patternless spotting of specimen shrubs, characteristic of the front yards of several generations ago, is considered bad taste today.

Somehow, the minds of many good flower growers appear to freeze up when confronted with shrubs. As a result, choice often is more stereotyped than need be. Perhaps it might be helpful to list some particularly desirable deciduous shrubs and flowering trees, many of which seem to have been overlooked in the rush to set out Pee Gee Hydrangeas and Van Houtte's Spireas.

ABELIA GRANDIFLORA (Arbutus Bush): Half-evergreen small shrub to 5′. Prefers well-drained soil in sunny, sheltered situation. May be killed back during hard winter, but has been grown successfully north of Boston. Too small for most backgrounds. Effective in border itself, or in foundation planting. Pinkish-white flowers borne continuously from June to November.

ACER PALMATUM (Japanese Maple): This species and *A. japonicum* constitute the Japanese maples, shrubby trees to 20′, grown for their finely-cut foliage and unusual color. There are many varieties. Choose carefully and don't overdo them. They're too conspicuous in many cases, but thoughtfully placed may be valuable accents. Grow best in half-shade and rather rich soil. *Acer ginnala,* a Manchurian species, and our native *A. circinatum* are possible substitutes.

*AMELANCHIER CANADENSIS (Shadbush): Small native tree reaching, in average soil, height of 30′. White flowers in early spring before leaves. Good summer foliage. Red-purple berries; shade-tolerant.

ARONIA (Chokeberry): Best species for garden use is perhaps Red Chokeberry, *Aronia arbutifolia,* a native preferring moist soil and growing from 6′ to 10′ tall. Early spring blossom, white or tinted red. Dull red, berry-like fruit.

AZALEA (Hardy Deciduous Azalea): Botanically, all Azaleas belong to the genus *Rhododendron* and, as one would expect, like loose, humus-laden, acid soil. Unlike Rhododendrons, they prefer sun. Faded flowers should be removed promptly or the next year's bloom will suffer; earth about them should be mulched with pine needles, oak leaves, or peat moss, but should not be cultivated as roots are very close to the surface. Easily transplanted in early spring or early autumn, or even in full flower. In general, deciduous Azaleas are more tolerant than evergreen types.

Among the most beautiful and easiest to grow are the Chinese (*Rhododendron sinense*) and Japanese (*R. japonicum*) species, their varieties and hybrids. In trade publications these are usually listed as Azalea Mollis, or Ghent hybrids. They're beautiful shrubs, 5′ to 6′ tall, with yellow, salmon or red flowers. Our native Flame Azalea (*R. calendulaceum*) with yellow to red or red-orange blossoms is remarkably showy, easily handled, and should be more extensively cultivated. It grows from 4′ to 10′ tall. The native Pinxter Flower (*R. nudiflorum*) is 2′ to 6′ with pink flowers; the Smooth Azalea (*R. arborescens*) of the Alleghenies, 8′ to 20′ with usually white flowers and bright red stamens; the White Swamp Honeysuckle (*R. viscosum*) 4′ to 8′ high, and fragrant; the early pale rose (*R. Vaseyi*), 5′ to 15′ tall—all are valuable garden types.

*BENZOIN AESTIVALE (Spicebush): This woodland native, 6′ to 15′ tall, prefers a peaty, moist soil and some shade. Its yellow flowers are effective in early spring and its foliage, which turns bright yellow also, contributes handsomely to a fall picture.

BUDDLEIA (Summer Lilac, Butterfly Bush): Though rather coarse growing and slow to start, Butterfly Bushes are in flower from midsummer to cold weather. In the north, they die down in winter; and it's best to cut them back in late spring to about 18″ and feed them well. They like sun and well-drained soil. The best species for the background is *B. Davidii* which may reach a height of 8′. The most shapely flowers are produced by lower growing varieties: the purple Ile de France, the lilac Fortune, the distinctly pink Charming.

CALYCANTHUS FLORIDUS (Sweetshrub): The natural range of this fragrant shrub, growing from 3′ to 6′

in sun or shade and average soil, is from Virginia to Florida. It is perfectly hardy farther north. A twiggy, rounded bush with no enemies to speak of, the perfume of its inconspicuous brownish flowers alone gives it a high garden rating.

CERCIS CANADENSIS (Redbud, Judas Tree): Not so good as the Dogwood, this little native tree—producing before its leaves rosy pink flowers—is nevertheless a desirable small-scale ornamental. Height is not likely to exceed 30′.

CHAENOMELES JAPONICA (Japanese Quince, Japonica): After trying several others, the technicians have finally wished this botanical name on the flowering Quince—which may be one reason why it's too infrequently planted. Shiny leaves, flowers, shape—all are good. Color range is from white to red; salmon hues especially nice. Forsythia and Japanese Quince should never be close neighbors. They bloom at roughly the same time and, to most eyes, their colors clash. For an informal hedge, 5′ to 6′ tall in a sunny place and average soil, this shrub is excellent.

CHIONANTHUS VIRGINICA (Fringe Tree): Slow growing but effective white-flowered small tree to 30′. Moist, sandy loam and sunny position preferred.

Clethra alnifolia (Summersweet, Sweet Pepperbush): This 3′ to 10′ native ranges from Maine to Florida, bears fragrant white flowers after most shrub bloom is over, likes moist acid soil. Remember it, if there are oaks on your place.

*CORNUS (Dogwood): In addition to the tree forms, the shrub dogwoods should not be overlooked. The Cornelian Cherry (*Cornus mas*) is a large twiggy shrub or small tree, possibly 20′ tall eventually. It's a good specimen, a good hedge subject, combines well with other material. Blossom is yellow, coming about two weeks ahead of Forsythia. Red Osier (*C. stolonifera*) grows about 8′ tall, and spreads. White flowers and red twigs distinguish it. The flat tiers of *C. alternifolia,* the gray branches and free-flowering habit of *C. racemosa,* the clean growth and bright twigs of *C. alba* commend them. These three average 10′ in height. To fit almost any situation, there's a dogwood—even a low, creeping herb, less than a foot high, *Cornus canadensis.*

COTINUS COGGYGRIA (Smoke Tree): Generally listed in commercial catalogs as *Rhus Cotinus,* the Smoke Tree is not, properly speaking, a Sumac but is adapted to dry, well-drained soil. A wide-spreading shrub, to 15′ tall, it often makes a good plant for the termination of a border, for its loose, feathery, purplish plumes add to apparent distance. The common name, Smoke Tree, is aptly descriptive.

CYTISUS SCOPARIUS (Scotch Broom): This spiky, to 10′, yellow-flowered, decorative shrub takes kindly to dry, sandy soil and is root-hardy wherever Buddleia can be grown. Only young plants transplant readily, but Scotch Broom—and some other Brooms—frequently can be naturalized. So can *Genista tinctoria,* which is very similar in appearance and habit, but lower-growing (about 3′).

DAPHNE MEZEREUM (Early Daphne): Against an evergreen background where its rose-purple flowers, borne well ahead of the leaves, may show to advantage, this unusual 4′ shrub may be a valuable border addition. Bloom sometimes occurs as early as February. A light, well-drained soil in a partly shaded position is considered best.

DEUTZIA (Deutzia): Well-known but not overplanted, thriving in average soil in sun or light shade, ranging from erect 6′ plants—like *Deutzia scabra*—to graceful 3′ ones—like *D. Lemoinei*—all Deutzias are good. Flowers for the most part are white, though tinted red, pink or purple in some varieties. Under a large, high-branched tree, I've seen *Deutzia gracilis* planted as an effective ground cover.

ELAEAGNUS ANGUSTIFOLIA (Russian Olive, Oleaster): This tall shrub, to 20′, is easily grown in any well-drained soil and possesses two great merits: its silvery foliage lends an aspect of distance to a landscape; the shrub withstands drouth better than most plants. The species *E. multiflora* (often listed as *E. longipes*), or Gumi, grows to 6′ under almost any condition. It bears bright red, cherry-like, edible fruit.

ENKIANTHUS CAMPANULATUS (Redvein Enkianthus): In humid, acid soil, this handsome member of the Heath family may reach 10′ to 12′. Red-veined, bell-like flowers aren't conspicuous but are decidedly ornamental and interesting. Fall foliage is a brilliant red. The lower-growing *E. cernuus* is a fine species also, particularly its red-flowered variety, *rubens.* They're no more difficult to handle than Azaleas to which they are, of course, related.

FOTHERGILLA MAJOR (Dwarf Alder): A dense, pyramidal shrub with odd, cockade-like white flowers in spring. In humid, well-drained soil averages 8′. Fall color is interesting.

GORDONIA ALTAMAHA (Franklinia): This far too rare native of a southern swamp is now available through Kelsey Nursery Service, 50 Church Street, New York City and perhaps other good nurseries. Hardy as far north as Massachusetts, it grows best in moist, peaty or sandy soil and may reach 30′. Shiny dark green foliage. Beautiful white flowers in fall.

HALESIA CAROLINA (Silverbell): Small native tree, hardy as far north as Massachusetts, covered in spring with drooping flowers resembling snowdrops. Easily transplanted, they thrive in average good soil.

HAMAMELIS (Witch Hazel): Late autumn or winter flowering distinguishes these hardy ornamental shrubs. Flowers suggest streamers of tissue paper, chiefly yellow. Adaptable, but prefer moist peaty, or sandy, soils. Japanese species likes a sunny position. Average ultimate height: *Hamamelis vernalis,* 6′; *H. virginiana* (the hardiest), *H. japonica, H. mollis,* 20′ to 30′.

HYDRANGEA (Hydrangea): Although some species have been overdone, others have been almost forgotten by gardeners. The Oak-leaved Hydrangea (*H. quercifolia*) is a very decorative 5′ to 6′ shrub, thriving in moist soil and a shady situation. *H. petiolaris* is a seldom grown but attractive vine, climbing by aerial rootlets. *H. arborescens* is a well-known border subject; but strong varieties of *H. opuloides* can sometimes be grown outdoors with winter protection. A very promising variety is Blue Bird (Wayside Gardens, Mentor, Ohio). Incidentally, pink types are likely to turn blue in acid soil and blue ones pink in alkaline soil.

KOELREUTERIA PANICULATA (Golden-rain Tree): Small, round-headed tree to 30′ with spectacular panicles of yellow flowers in July. Likes sun and average soil. Interesting balloon-like seedpods and compound foliage.

KOLKWITZIA AMABILIS (Beautybush): Very handsome small shrub to 6′, suggesting a miniature pink Weigela but lacking its coarseness. Prefers sun and a well-drained soil.

LABURNUM (Golden Chain): With clover-like leaves and lemon-yellow blossoms similar in form to Wisteria, this graceful small tree to 20′ in most cases is startlingly fine. Indifferent to soil, sun, shade, and apparently free from enemies. Plant is said to be poisonous; but so is Monkshood and Laurel. The variety *Vossi* is the hardiest and most floriferous.

LAGERSTROEMIA INDICA (Crape Myrtle): Blooming from 60 to 90 days, strong and tolerant, this shrub is to the South what Lilacs are to the North. Blossoms pink, white, red. Not hardy north of Baltimore.

*LONICERA (Bush Honeysuckle): Well-known, tolerant shrubs, seldom overplanted. Usually grow as wide as they are tall. Among the best for small gardens are: *Lonicera Morrowii,* 6′ to 7′; half-evergreen *L. fragrantissima,* 6′ to 7′; *L. syringantha* var. *Wolfii,* 3′ to 5′.

MAGNOLIA (Magnolia): For gardens, Magnolias, Flowering Crabapples and Flowering Cherries form a powerful triumvirate of beauty. Magnolias, the most startling member of the trio, like a rich, well-drained soil—such as may often be found on a moderate eastern slope—and should be transplanted in spring only. The great evergreen tree of the South, *Magnolia grandiflora,* isn't likely to survive north of Baltimore. But many fine species are hardy north. For small gardens, the shrubby Star Magnolia (*M. stellata*) is perhaps the best of all; though all varieties of *M. Soulangeana,* the Yulan Magnolia (*M. denudata*) and *M. Fraseri* are excellent, too. There are no poor Magnolias. If you have a damp, shady spot, remember the Swampbay (*M. glauca*).

MALUS (Flowering Crabapple): By botanists, Apples and Pears are usually grouped under the genus *Pyrus,* but most catalogs list the hardy and remarkably beautiful Flowering Crabs under the Greek word for Apple. Don't let that stop you from planting these wonderful little trees, adaptable under average soil conditions to use as specimens, hedges, mass effects. Particularly stirring are the double rose-like Bechtel Crab, the profuse pale pink Scheidecker Crab, the semi-double Arnold Crab, the brilliant reddish-pink Parkman Crab. And have you ever seen a hedgerow of the bushy Carmine Crab? All many gardens need to achieve distinction is a few good Crabapples in place of overworked Spireas.

*MYRICA (Bayberry, Wax Myrtle): The Bayberry is *Myrica carolinensis,* a rounded, gray-leaved, aromatic shrub, growing in sandy sterile soil from 2′ to 8′ high. It's very handsome and deserves wider garden use. Wax Myrtle is *M. cerifera,* very much like Bayberry except that it grows eventually into a slender tree, prefers moist and peaty soil, and isn't hardy north of Maryland. The two species are often confused.

PHILADELPHUS (Mock Orange): Too well known to need description, attention should perhaps be called to the extraordinary beauty of the flowers of the leggy hybrid double, Virginal; the good form of *Philadelphus splendens;* and the unsurpassed fragrance of *P. coronarius.* Considering the wealth of sweet ones, odorless types do not seem worth growing.

PHOTINIA VILLOSA (Christmas Berry): Treelike shrub to 20′; white flowers in June, followed by scarlet fruit. Fall foliage bright red. Tolerant of soil, likes sun.

PRUNUS (Flowering Cherries, the Stone Fruits): From a flower garden standpoint, the most important group in this large genus is that comprising the single and double Japanese Flowering Cherries. Varieties are numerous, and a good deal of confusion as to names exists. It's a good scheme, therefore, to visit a reliable nursery before making a choice. Incidentally, the virtues of the native Beach Plum, *Prunus maritima,* are many: tough, ornamental, thriving in sterile soil, fruits can be made into good preserves. In a small garden there's often not room for both Flowering Crabapples and Japanese Cherries. My ballot, in such a case, is cast in favor of Flowering Crabs.

SYRINGA (Lilac): The common Lilac, *Syringa vulgaris,* grows just about anywhere and for its grand perfume is held in universal esteem. But it's a big shrub to 20′, spreading by suckers; and its large leaves may dwarf a little garden. For small gardens, the not so rampant French hybrids (preferably on their own roots) and two narrow-leaved species, *S. chinensis*—to 12′—and *S. persica*—arching, to 10′—are particularly appropriate. The white variety of *S. chinensis* makes a wonderful informal hedge.

TAMARIX (Tamarisk): Generally listed in catalogs as *Tamarix africana,* but properly *T. parviflora.* Tamarisk is a treelike shrub to 15′ of value on dry land, especially near the seashore for it can withstand even salt spray. Flowers in spring are like a pink mist, adding distance to border or vista. Though natives of hot countries, most species are hardy as far north as Massachusetts.

VIBURNUM (Viburnum): Don't limit your acquaintance in this genus to the Snowballs. There are other Viburnums even nicer: the clean and handsome *V. tomentosum*, to 8′, one of the very best of shrubs though less frequently planted than its double form, the Japanese Snowball (*V. tomentosum* var. *plenum*); the tall, thin Arrow-wood (*V. dentatum*) which needs moist soil, grows to 15′ but can be held back by removing older branches at the base, and possesses an ideal background form and habit; the very fragrant *V. Burkwoodi*, an improved form of the Korean species *V. Carlesii*, which grows 4′ tall and even more than that wide; the shade-loving Dockmackie (*V. acerifolium*) which averages 5′ and can stand the dry soil under big trees; the pink-fruited *V. Sieboldii*, to 10′, which belongs in the background, for its leaves when crushed emit an unpleasant odor. In general, the Viburnums are tolerant of soil conditions so long as enough moisture is present. (Dockmackie is an exception.) They grow cleanly, are seldom bothered by disease or insects (with the exception of the old-fashioned Snowball, *V. Opulus* var. *sterile*, which is seriously affected by aphids) and are distinguished by excellent foliage and interesting fall color. The Black Haw* (*V. prunifolium*), a spreading not overly handsome shrub to 15′, appeals tremendously to birds.

* Natural Bird Food. Those shrubs in the above list, which have been marked with an asterisk, are particularly attractive to birds which feed upon their fruits.

In addition, the following might be mentioned as calculated to bring into a garden in which they are planted many natural insect hunters: Virginia Creeper (*Parthenocissus quinquefolia*), Hackberry, Hawthorns, native Holly (*Ilex opaca*), Red Cedar, Mulberry, Tupelo or Pepperidge (*Nyssa sylvatica*), native Cherries and Sumacs, wild Roses, Elderberry, Mountain Ash, wild Grape (*Vitis*), Indian Currant (*Symphoricarpos orbiculatus,* usually listed in catalogs as *S. vulgaris*).

Monotony is inherent in hedges, whether they be clipped formal ones or occasionally pruned informal ones. Yet this drawback, in most small gardens, may be fairly readily overcome.

When space allows, the planting behind the hedge of flowering trees or large shrubs breaks up the even line which, alone, might be dull. When the hedge is on the boundary and next-door planting doesn't happen to relieve the situation, a pleasant contrast to the hedge's regimentation may nevertheless be effected by the introduction into the border itself of unusual specimen trees or shrubs. These specimens should differ from the background, of course, in form and texture; they should be of more than average interest; and they should grow upon reasonably conservative and cooperative roots. Selection should, naturally, be guided by the scale of the border.

Among plants particularly well adapted to such uses are Magnolias, Flowering Crabapples, pink or double white Dogwoods, Voss's Laburnums, Franklinias, Virginal Mock Oranges (which need to have their knees hidden anyway), Sweetshrubs, hybrid Blueberries (*Vaccinium,* especially var. Jersey), the Buddleias Fortune and Charming, Shrub Roses, deciduous Azaleas, Morrow's Honeysuckles, Wisterias trained to tree form, Tree Lilacs, Tree Peonies; and such evergreens as Boxwood, Yew, small-leaved Japanese Holly (*Ilex crenata* var. *microphylla*), American Holly, Mugho Pine (*Pinus montana* var. *Mughus*), Pfitzer's Juniper, Irish Juniper, Mentor Barberry (half-evergreen), Laland's Firethorn, *Yucca filamentosa.*

An edging fashioned of plants of one variety is, of course, just a tiny hedge. Curiously, it is formal without being monotonous, principally because perennial form and foliage within the border insures contrast. Except in purposely naturalistic borders or woodsy plantations, where edging plants would usually be sweeping groups of different species, there's good reason to welcome the finished, professional appearance produced by a more or less permanent edging. Such a finishing line may be composed of sub-shrubs or perennials; or it may be made of brick on edge, of stone laid up dry or with mortar, like a little wall a few inches high (but never placed on edge for that suggests the ragged teeth of a giant), even of weather-resistant cypress or redwood.

Best of all, to my way of thinking, is dwarf Boxwood—either young plants of *Buxus sempervirens* var. *suffruticosa* or the naturally low-growing, very hardy Korean species, *Buxus microphylla.* Dwarf Yew or clipped Germander (*Teucrium Chamaedrys*) runs Box a close second. The exquisite little evergreen shrub, *Daphne Cneorum,* in well-drained light soil and a sunny or very lightly shaded situation, makes a lovely edging; particularly when the first crop of fragrant pink flowers is removed as it fades and the plant thus kept compact. Unfortunately, this little gem is likely to be short-lived in most gardens. It should be attempted, nevertheless, in all.

Perennials also, provided their foliage remains in good condition most of the season, may be most satisfying. Among especially fine edging plants might be listed the following: *Aquilegia flabellata* var. *nana-alba; Arabis alpina* var. *flore-pleno* (cut back after flowering); dwarf hybrid Hardy Aster, particularly the varieties Lavanda (lavender-blue) and Niobe (white); *Campanula carpatica* (should not be allowed to set seed and is then one of the very best); *Dianthus plumarius,* particularly varieties Essex Witch (pink) and White Reserve; *Dicentra eximia; Hosta caerulea* and *Hosta lancifolia; Iberis sempervirens* (shear after flowering); *Iris cristata;* fall-blooming Iris Ultra (blue) and Jean Siret (yellow); dwarf Lavender (*Lavandula vera* var. *compacta*); *Nepeta Mussini* (very fine when grown in well-drained soil and cut back after first flowering); *Veronica incana* (woolly-white foliage, blue flowers) and *Veronica Teucrium* var. Heavenly Blue; and in moist soil or shade, Sweet Violet (*Viola odorata*).

Questions of color arise, consciously or unconsciously, in all gardens. Since reaction to color is as individual as a toothbrush, there's not much to be gained by becoming too hot and bothered over the subject. To one person, a crimson Oriental Poppy may be a veritable sock in the eye; to another, the merest maiden's blush. No doubt it's all done with glands.

It was Professor Hugh Findlay of Columbia University, I believe, who sagely pointed out that all gardens were fundamentally green. In that remark, hides the key to harmony: enough green, enough foliage masses to alleviate fancied clashes and almost anything of merit can be happy in a border. Moreover, garden colors change from day to day, from hour to hour. A clouded sky intensifies blue, tones down red; a bright sun lays a yellow cast over every leaf and blossom.

Perhaps reading Chapter VI of *Color and Succession of Bloom in the Flower Border* by H. Stuart Ortloff and Henry B. Raymore—an annoyingly dogmatic book but none the less stimulating—may sharpen your senses. It is well worth your while. But if you really yearn to improve your perception of color, you should take up painting in oil. Yes; I mean it seriously. You don't have to paint well to enjoy it, you know. You can make a secret vice of it, if you like. But try it. Only after you've sought to capture nature in pigments will you begin to *see* color as it is, instead of as you think it must be from casual observation chiefly of reproductions of it.

Personal preferences grow more sharply defined as one works with color, in pigments or in plants. By experience, as the eye is educated, we increase sensitivity. Some of us at birth were blessed with talents which we develop. Yet all of us, if we keep at it long enough, will evolve an individual color code.

I'm sure I must have my own. I like to get lots of blue and blue-violet into small gardens, because I think it makes them look larger. I like to wake up these cool hues, to bring them out and to make the border sparkle by the sparse use of warm orange or apricot tones, to accent them with occasional clear scarlet. I shy away from strong yellow, like that of Coreopsis, though I rejoice in the soft spring flood of daffodils. And I try to work in plenty of creamy white or lemon-yellow as a corrective for possible garishness.

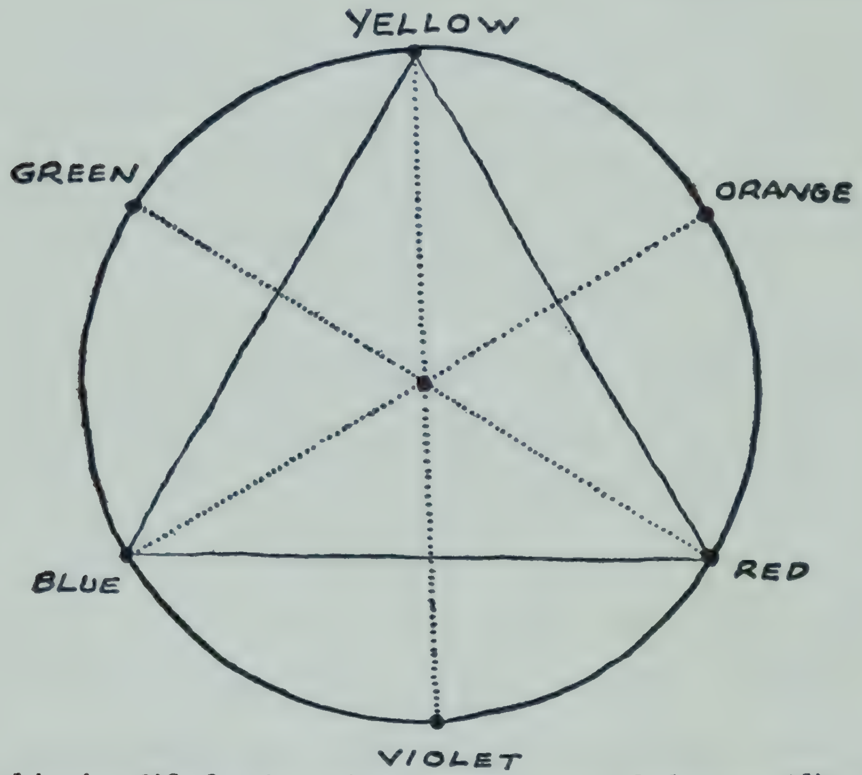
A color expert, I suppose, might say I leaned toward split complements: that is, green (foliage), blue and violet set against yellow-orange and red-orange. Perhaps that is so. A painter might approve my compositions so long as they were "in key," by which he would mean, so long as color intensities were equal or small amounts of pure hue were balanced by larger masses of a tint, or pastel. Perhaps that is so, too. Without being too analytical about it, my own feeling with respect to the five-color combination which we've taken as an example is something like this: I recognize that the garden is primarily green. To that overall hue I add a dominant flower color—blue—because I suspect it will make this particular garden seem more spacious. Now I have blue and green together, both cold. (Green, blue and violet are cold colors; red, yellow and orange are warm ones.) So I bring the blue and green to life with a few bold, sultry touches, hedge a bit with neutral off-white and lemon-yellow, and hope for the best. What I don't like the next year, I'll try to change. And, in the process, I'll have more fun than Frank Buck's monkeys.

For its suggestive value, it's useful, of course, to be familiar with a simplified color wheel (see page 172) representing average reaction to combinations; and to have a bowing acquaintance with color nomenclature, at least the following terms:

hue, full-strength color of the spectrum; *tint,* hue with white added; *shade,* hue with black added—that is, grayed color; *chroma,* intensity.

On the color wheel most often used, six primary colors are located as follows: yellow at north, orange at northeast, red at southeast, violet at south, blue at southwest, green at northwest. Colors opposite on the wheel balance each other (simple, or direct, complement), thus: red goes with green, orange with blue, yellow with violet. Alternate colors clash until brought into harmony by a third color at the apex of an equilateral triangle, thus: red, yellow and blue is a harmony; green, violet and orange is a harmony (split complement); but drop out one color from any such trio, and disharmony results. These generalities apply also to tints or shades or hues in between the primaries of the wheel. You can see these balances arrived at in nature. Take Tritoma, for example: the combination yellow-orange and red-orange in the blossom would conflict but for the presence of blue-green in the foliage. A split complement, you see. The Garland Flower (*Daphne Cneorum*), on the other hand, represents a simple complement: pink blossom (a tint of red) balanced by green foliage.

This sort of thing can be a lot of fun. It gives garden club ladies a chance to scream about magenta at meetings, while letting their Hardy Phlox at home in their gardens seed itself all over the place. It adds a fillip to the garden art. But just remember it *is* an art and, therefore, perhaps more emotional than rational, more subject to influences derived from the heart than from the head, motivated more by feeling than by hard and fast rules.



On this simplified color wheel, simple color balances (direct complements) are indicated by dotted lines, while the triangle shows how a 3-color harmony (split complement) may be plotted. The suggestive value of such a wheel is further explained in the text.

Don't take color schemes too seriously. Don't let its pseudo-technical chatter get you down. And *don't be afraid of color.* With which admonishment, the matter may be dropped. The chances are you'll barge right ahead and plant what you like, anyway.

Summary of Chapter V: *The mixed flower border offers an opportunity to indulge our catholicity of taste in plant material in relatively small space. Composed primarily of perennials, augmented by bulbs and annuals—preferably in long, narrow drifts—and set against a good background, the mixed border can be far less wide than an all-perennial border. Annuals should be screened by sound, all-season foliage of foreground plants.*

In planning the mixed border, we think of it as divided into five strips: edging, foreground, middle ground, rear strip, background. But in actual planting, we are careful not to place plants in exact rows, for the border is to be viewed from different angles at different times. Any exposure, except a northern one, is suitable. Large tree roots should be avoided.

The main structural, or backbone, perennials *are Iris, Peony, Hardy Phlox, Chrysanthemum, Hardy Aster. Backgrounds are essential to display and to unity. They are of four general types: masonry, wooden, hedge, shrub-and-tree. Each has special qualities. An informal hedge of shrubs and flowering trees may be particularly delightful and unhackneyed. A suggestive check list of frequently overlooked background material may be helpful; and shrubs attractive to birds may be included.*

Monotony, inherent in hedges, may be overcome through varying the skyline by planting occasional large shrubs or flowering trees behind the hedge or within the border. Certain plants are particularly suited to this purpose, just as certain plants with good foliage are particularly suited to edgings. Lists are included.

Questions of color, consciously or unconsciously, arise. All gardens are fundamentally green; but individual color codes become established as experience educates the eye. While it is well to be familiar with color nomenclature, with the color wheel, and with standard color harmonies, don't be too solemn about color schemes. Remember that gardening is an art, more emotional than rational. Don't be afraid of color.

CHAPTER VI

THE SOLACE OF PERENNIALS

What They Are and How to Keep Them Happy; How and When to Divide and Transplant; How to Increase Stock from Seeds or Cuttings; Advantages of Named Varieties with an Explanatory Word on Botanical Nomenclature; The Big Five—Iris, Peony, Phlox, Aster, Chrysanthemum; A List of Other Superior Sorts, Their Virtues and Their Vices; Vines; Summary.

Nothing equals perennials, so far as the happiness of the flower gardener is concerned. They are his most dependable friends. By perennials we usually mean "hardy herbaceous perennials" for trees and shrubs and many grasses are perennial, too—which is to say they tend to live from year to year. Annuals live one year; biennials, two years. But hardy perennials, if grown in deeply prepared, humid soil, if well fed, protected from enemies and divided and reset often enough, do their best to grow larger and finer from season to season.

However, *perennial does not mean perpetual.* People are prone to fall into this error and, as a result, neglect to keep up soil fertility in established hardy borders and perennial beds. When we say a perennial dies down to its roots in winter and comes up the following spring, we speak loosely. What does occur in general is that not only the top but part of the root dies, while from the outer crown new growing points (eyes or buds) develop. From these new root portions, new shoots arise the following spring. Gradually, thus, the original plant disappears. A younger plant takes its place. In the process, the clump spreads in a crude, ever-widening circle and in so doing depletes the soil. Without food, no plant can live.

Under Chapter III, we expounded the importance of thorough soil conditioning and of subsequent feeding and cultivating. Now let's consider why perennials need to be divided and reset in fresh earth; and how and when to carry out that duty.

"Divide and transplant every third year" is a phrase repeatedly recurring in catalogs. This good advice would be more accurate were it worded: "Divide and replant divisions in fresh, well-conditioned earth when the plant needs it, probably every third to fifth year." How may the gardener recognize this need for division?

The plant expresses dissatisfaction with its abode quite definitely. The center of the crown dies out, leaving a bare spot; and with that usually comes limited production of flowers, or dwarfing of leaf and flower—in other words, starvation. Some plants can adapt themselves to one spot for many years; others quickly exhaust the soil assigned to them and either move into the territory of weaker neighbors, or themselves lose vigor and finally perish. For example: Fraxinella (*Dictamnus albus*) is often able to exist without a shift for twenty to thirty years; Cottage Pinks (*Dianthus plumarius*) tend to grow woody and rot out in winter, if not divided and reset after the third season. Always the experienced gardener is alert to the health of his plants. When he sees some clump flying distress signals, he makes a note that a move is indicated at the next transplanting period. In due time, the division is made and segments of the original plant are replanted either in fresh soil in the same place, or in some other places. The excess, if in sound shape, is usually given away to some fellow enthusiast—a generous gesture typical of gardeners the world over.

When should this dividing and resetting take place? In general, perennials may be divided after flowering has ceased. Thus, Bunch Primrose (*Primula Polyantha*) may be moved in early June; tall Bearded Iris in July; Oriental Poppy in late August, after its dormant period. Or separations may be made during the two standard transplanting seasons: early spring, early fall.

As a matter of convenience, the bulk of dividing and resetting is carried out in most borders during September and October. Residential changes looking toward improvement are made each autumn for several years after the original planting. By the fifth year, plant groups will have grown considerably out of proportion to each other. The Bearded Iris will be too dominant. The False Dragonhead will be waging a war of aggression. The time will have come to redesign and remake the border practically entirely; and, during the ensuing activities, to work deeply into the soil large quantities of cow manure and peat moss and other such humidifying agents. Those plants which bloom quite late, such as Hardy Asters and Chrysanthemums, are better left undisturbed until spring, when they may be divided and transplanted. Experience with perennials soon teaches the gardener to recognize the few groups which take more kindly to spring, than to fall, moving.

How are divisions made? As a rule, simply by removing a clump from its position, thrusting a sharp spade right through the crown and cutting the plant into two or more small plants. These divisions are then set in holes previously dug for them, watered thoroughly, mulched to prevent loss of moisture, and their tops are cut back about halfway to compensate for root injury. Not a very complicated business.

Plants with fine matted roots, like *Iberis sempervirens*, are perhaps best torn apart with the fingers, aided possibly by a short-handled transplanting fork. With heavy-rooted perennials, like Peony, it's better to wash off the dirt and with a sharp knife cut the crown into sections. In so doing, be careful not to harm the growing points. At least three eyes (growing points) should be left intact on each Peony division; nor is it a bad general rule. For transplanting and dividing most perennials the very best tool, it seems to me, is a D-handled drain spade. Its rounded blade is 5 inches wide and 16 inches long. Its curved edge penetrates the earth, or slices through a crown, easily. The tool is strong without being heavy, does not quickly tire the user, and to women gardeners (whose name is legion, praise be) is a priceless boon. For some curious reason, the drain spade doesn't seem to be thought of as a garden tool. If your garden supply house doesn't stock it, look in a mail-order catalog!

Multiplication of varieties is, of course, a by-product of crown division. But sometimes one would like to acquire fairly soon a larger stock of a certain plant without the expense of purchase from a nursery. What then? The answer is: raise the plant from seed; or grow it from cuttings.

FROM SEEDS: Seeds represent sexual reproduction of plants and therefore some variation is to be expected from them—possibly even a worthy new variety. Annuals may be a bit easier but many perennials grow quite readily from seed. Seeds of some types—such as Roses and Peonies—aren't available through ordinary channels and are beyond average amateur effort, anyhow. Such seeds as can be procured, however, are quite likely to produce for the reasonably conscientious amateur a fair percentage of sound plants.

Sow in sterilized seeding soil (Duckham's Steriloam is on sale at good supply houses); or in soil made up of one-third leafmold (humus) or fine peat moss, one-third good garden loam, one-third sand in special seed bed, seed pans, seed flats, or cold frames. Sow during late May and early June. Plants then will for the most part be just the right size to weather over the first winter successfully, without having weakened themselves by late flowering. Sow thinly, barely covering seeds with soil. Press down with flat board, cover with burlap, newspaper or cheesecloth and water with fine spray. Do not allow to dry out. Keep soil moist but not wet. Remove covering when germination takes place. Transplant or thin out, as soon as seedlings are large enough to handle.

One convenient routine is to start in flats; transplant to stand 6 to 12 inches apart into well-prepared temporary bed which should be airy but lightly shaded. Some people transplant to a vegetable garden and shade young perennials with a framework of laths. My method is to transplant to a special bed in an open situation on the south side of which has been erected a picket fence, throwing a light shade. Transplant, finally, in September to permanent border position.

Among good perennials to be expected from seed are Alyssum, Anchusa, Aquilegia, *Campanula carpatica,* Centaurea, *Cerastium tomentosum,* Coreopsis, Delphinium, Dianthus, Digitalis (a few are perennial but best types are biennial; biennials—or plants grown as biennials, such as Snapdragons, Pansies, Violas—are best sown in August), *Echinops Ritro, Hesperis matronalis,* Heuchera, Hollyhock (sow in heavy soil, July-August, inclined to be biennial), *Iberis sempervirens, Iris* *dichotoma,* Linaria, *Linum perenne,* Platycodon, Polyanthus, Pyrethrum, Veronica and some others.

FROM CUTTINGS: Multiplication by stem cuttings (slips), root, or leaf cuttings represent asexual, or vegetative, reproduction. By vegetative propagation, variations to a large extent are avoided. Vegetative increase is a professional operation, for the most part, carried on with bottom heat under glass in propagation house or cutting bench. Detailed practices vary with the varieties handled.

However, many perennials strike (form roots) readily from soft wood cuttings—tips of new growth, 1 inch to 3 inches long containing usually three leaves, such as are obtained when shearing hardy Candytuft, for instance—or from cuttings of older wood. Highest percentage of success in rooting is usually secured from wood of current year's growth which is old enough to snap, not give, when bent. Many shrubs and flowering trees, as well as herbaceous perennials, can be rooted from such cuttings—wood taken in August in the majority of cases.

Should you try working with cuttings, these are the principal considerations: Basic requirements are (1) Rooting Medium; (2) Shade; (3) Moisture;

(4) Potting Facilities. Rooting medium is generally clean sharp sand or sand-and-peat moss. Shade is usually secured by placing laths 1 inch apart over glass of greenhouse cutting bench, or over outdoor cold frame. Moisture to the verge of wetness may be provided by watering with a syringe or fine rose. Prevent wilting by removal of a portion of foliage on cutting. Plant the little stems in the rooting medium with a dibble, or in a little trench, close to each other but not touching. (Don't just shove cutting into sand.) Firm sand about them. Water, shade, keep moist. As soon as roots are one-eighth to one-fourth of an inch long, transplant rooted cuttings to clean 2-inch pots, using potting soil composed of two parts good loam to one part each of sand and humus. Water the potted plants which are usually placed on a flat for convenience in handling, shade for a day or so, then give good light and air. When pots are filled with roots (knock out a pot and look at the roots to make sure), shift to next size pot (don't skip sizes), or transplant—weather and season permitting—to protected temporary bed for growing on, or set out in permanent positions in the border. Your cuttings are young plants by now and can

be handled as such. Do not take plants directly from the house or frame to the open border. Plants started under artificial conditions must be exposed to outdoor conditions gradually, a little longer each day—a standard practice known as hardening-off.

A more recent method of raising plants from cuttings involves the use of chemicals which speed up the formation of roots, a process originally developed by the Boyce-Thompson Institute for Plant Research. Such a compound is Hormodin Powder (also available in liquid form) manufactured by Merck & Co., Rahway, N. J., and now on sale at most good garden supplies stores. With this product, or that of any other reliable concern, follow the manufacturer's directions. Advantages offered by the chemical include higher percentages of success as well as relative ease of rooting cuttings of American Holly, Japanese Yew and other plants which are difficult under standard techniques.

If you intend to work with but few cuttings, a propagation box for use, say, in a window of the house may be constructed by fitting glass sides and a glass top to a seed flat, or any other wooden box 3 to 4 inches deep. Out of a rectangular aquarium, you could make a very snappy one—a kind of Wardian case. Watch ventilation. If moisture condenses on glass, wipe off the drops and insert a wooden label, or some other thin article, under the glass top for better air circulation. Don't forget shading—a north window would provide just about the correct degree of it, something like the light under a grape arbor which was a favorite spot for "slipping" plants in the brave old days; nor that you must be prepared, of course, to pot up the cuttings when they're rooted and to take care of the little potted plants, giving them light and air and water—maybe a pinch of food or a spraying—until they can go outdoors.

Named varieties of annuals, with few exceptions, are grown from selected seed strains. It would perhaps be more accurate to name the strain: to refer to the Harmony Strain of Marigolds rather than to the Marigold, Harmony, as we do. But named varieties of *shrubs* and *herbaceous perennials* are virtually always propagated vegetatively; and unless a plant submits to increase by such means we do not consider it a true perennial.

Each rooted cutting, though physically separated from its parent, is in effect a living part of the original plant. From one viewpoint, every rhizome in the world today of the great Bearded Iris, Copper Lustre—to give a specific example—may be said to be a vegetative offshoot, a division of that first and only Copper Lustre which Dr. Kirkland, several years ago in Nashville, Tenn., produced from seed. The relationship between cutting and parent is much closer than between seeds and parents. One might say a plant raised from a cutting has a parent but no father nor mother, and certainly no grandparents; while seeds—although fixed strains do reproduce the type with adequate fidelity—may at any time display hereditary qualities, either mean or noble, of generations gone and forgotten.

Obviously, the garden maker is greatly aided in his work when he can secure young plants which (discounting, of course, bud mutations and purely environmental factors) will be exactly like a superior forebear instead of only approximately like one. Thanks to vegetative propagation—that is, to horticultural, or named, varieties—gardens everywhere may be planted to superior types and thus helped to be superior gardens.

On the part of laymen there's a good deal of confusion, not to say annoyance, with regard to botanical names. Yet it's clearly of benefit to all who deal with plants for profit or for pleasure to agree on what they're talking about. Here's a case in point: the common name, Myrtle, may refer to the classic evergreen shrub *Myrtus communis*; or to the southern Crape Myrtle (*Lagerstroemia indica*); or to Trailing Myrtle, the Periwinkle (*Vinca minor*); or to the native Sand Myrtle (*Leiophyllum buxifolium*). If you ordered merely Myrtle from a nursery, which of the four would you mean? Ever since Linnaeus by publication in 1753 of *Species Plantarum* began the classification of plants based upon a uniform principle, botanists (with horticulturists in their wake) have tried to get together on these matters.

The garden maker who refuses to learn the Latinized, or technical, names of plants is cutting off his nose to spite his face. His appreciation of plant types is hazier than need be; and he deprives himself of the possibility of broadening his horticultural horizon because, since he does not know how to look for it, he closes the door to vast stores of practical information contained in standard reference works. Moreover, he is inconsistent. He calls *Iris* "Iris"; but he thinks it silly to recognize Columbine as *Aquilegia.* He knows no other name for *Cosmos* and *Dahlia* and *Crocus* except the generic one; yet he entertains the notion that *Helenium* is high-hat for Sneezeweed. Common names are often picturesque and pleasant. They deserve a place in our speech. But to stop there is to be satisfied with too little, like the tramp who didn't want a quarter "because he already had one."

Plant names are arrived at something after this fashion: the vegetable kingdom is divided into classes, classes into orders, orders into families, families into genera, genera into species, species into varieties. To gardeners, the last three are important.

Now, to see how it works, take a Columbine: *Aquilegia chrysantha* var. *alba-plena.* What does that mean? *Aquilegia* is the genus, derived from the Latin *aquilegus,* water-drawer; *chrysantha* is the species, golden-flowered; *alba-plena* is the variety, white-full—that is, white inclined to be double. In other words, if we can recall a little of our prep-school classics we know something about that flower when we see it listed, even though we may never have seen it growing. We know it is a pale yellow or whitish more or less double type of the native golden-flowered Columbine. Sometimes the var. (variety) is dropped out. The plant name then appears as *Aquilegia chrysantha alba-plena.*

Suppose the plant in question were a hybrid, a type produced deliberately by man instead of accidentally by nature. It might be written thus: *Philadelphus Lemoinei* var. Avalanche, Hort., a type of Mock Orange developed by a person named Lemoine which has been given the descriptive name, Avalanche. Or the whole group of hybrids might be known as *Philadelphus Lemoinei,* Lemoine's Mock Oranges, as though Lemoine had developed a different race of Mock Oranges. And this is precisely the fact. Often the species from which the hybrid derived are dropped out in commercial, or more technical, listings. Indeed, in those genera which have been in cultivation for a very long time the pedigree of a garden form may be known only to studious geneticists, or may even have been altogether lost in antiquity. We don't expect to find E. G. Hill's famous Hybrid

Tea Rose, Radiance, listed as *Rosa odorata* var. Radiance. That would take up space without furnishing much useful information, for blood of species other than the original Tea Rose, which was brought from western China to England in 1810, enters into the ancestry of Radiance. Long-established garden flowers among Roses, Phloxes, Peonies, Irises and the like are frequently known to well-informed gardeners by their personalized names only. So inbred, so artificial in the course of time have some of them become that they have as little practical kinship to the wild types from which they originated as a champion egg-laying Leghorn hen has to a jungle fowl.

Many other plants grown in gardens still are close to nature. In any event, it is both interesting and instructive to discover in technical terms (when we can) clues to plant habits; while accuracy and reference work make necessary familiarity with the botanical names of at least the principal genera and species.

The big five of borders, as we've pointed out, are Iris, Peony, Hardy Phlox, Hardy Aster and Chrysanthemum. Their form or foliage is perhaps equal in value to their flowers. They give the border solidarity as well as color in spring, summer and fall. We've considered soil preparation and maintenance, border planning, the place of annuals in mixed borders, edgings, backgrounds. Now let's get down to flower details. Let's call attention, in the briefest and most useful way, to outstanding species and varieties among the Big Five.

IRIS (Iris): This large genus is aptly named for the rainbow. Most sorts are easily grown. Rhizomatous types are sometimes attacked by a relative of the cutworm, the Iris Borer. Soft rot follows its tunnels. Control consists of destroying old leaves, burning over Iris plantations during winter or very early spring to eradicate eggs.

Iris cristata: Spreading 6″ native; blossom April-May, blue, white (var. *alba* rare); any soil, sun or shade. Shade preferred. Fragrant.

Iris tectorum: Crested species from China, Japan, 12″ to 18″; blossom May, blue-violet, white (var. *alba*); average soil, sun or shade.

Iris sibirica: Hybrids of this species are good cut flowers, essential border clumps; bloom May; humid but well-drained soil; fertilize with manures, avoid lime (no bonemeal); sun or shade; good varieties include Emperor, 48″, purple; Perry's Blue, 48″, sky-blue; White Way, 38″, white.

Autumn-flowering Iris: New hybrid race of great promise. Bloom April-May, September-October. Average soil, sun. Bonemeal. Good varieties include Black Magic, 28″, deep blue-violet; Ultra, 18″, ultramarine-blue; White Autumn King, 30″, white; Peggy Babbington, 28″, soft yellow.

Tall Bearded Iris: In this hybrid group, descended from *Iris germanica, I. florentina, I. pallida* and others, we find truly marvelous flowers of virtually every color and blend. So great has been the development that all present-day gardeners should be on some specialist's mailing list. (Robert Wayman, 39-09 214th Place, Bayside, Long Island, N. Y., is one good one.) May-June flowering, easy to grow. Choose thoughtfully. Resist temptation to overdo in mixed border. Among fine varieties are: Shining Waters, 48″, pale blue; Sierra Blue, 50″, deep blue; Missouri, 44″, very deep blue; Dominion, 32″, blue-purple; Dauntless, 40″, red; Fragonard, 36″, rose-pink; Pink Satin, 46″, soft pink; Brown Betty, 43″, deep tan; Copper Lustre, 38″, metallic copper; Naranja, 40″, orange; Summer Tan, 38″, tan blend; Mary Geddes, 36″, medium blend, effect pinkish-red; Depute Nomblot, 48″, deep blend, effect copper-red; Golden Hind, 38″, deep yellow; Lady Paramount, 44″, pale yellow; Wasatch, 40″, white plicata with blue "feather-stitch";

Gudrun, 42″, white; Kalinga, 48″, cream; Jean Cayeux, 36″, tobacco brown; many others.

Iris fulva: Louisiana swamp species. Sprawling foliage, interesting flattish brick-red to copper bloom, 30″, late June. Humid soil, sun or shade, hardy north. Other beardless species and hybrids available in other colors, red-violet predominating.

Japanese Iris: Hybrids developed principally from *I. laevigata* are among the most beautiful flowers in the world. Need sun, water at flowering time, rich soil. Add peat moss and cow manure to soil. Avoid lime (no bonemeal). Among splendid varieties are Gold Bound, 34″, reliable white; Helene, 36″, white ground laced with pinkish-blue; Koki-No-Iro, 44″, double purple; Mahogany, 36″, double mahogany-red. Many others; mostly July-flowering.

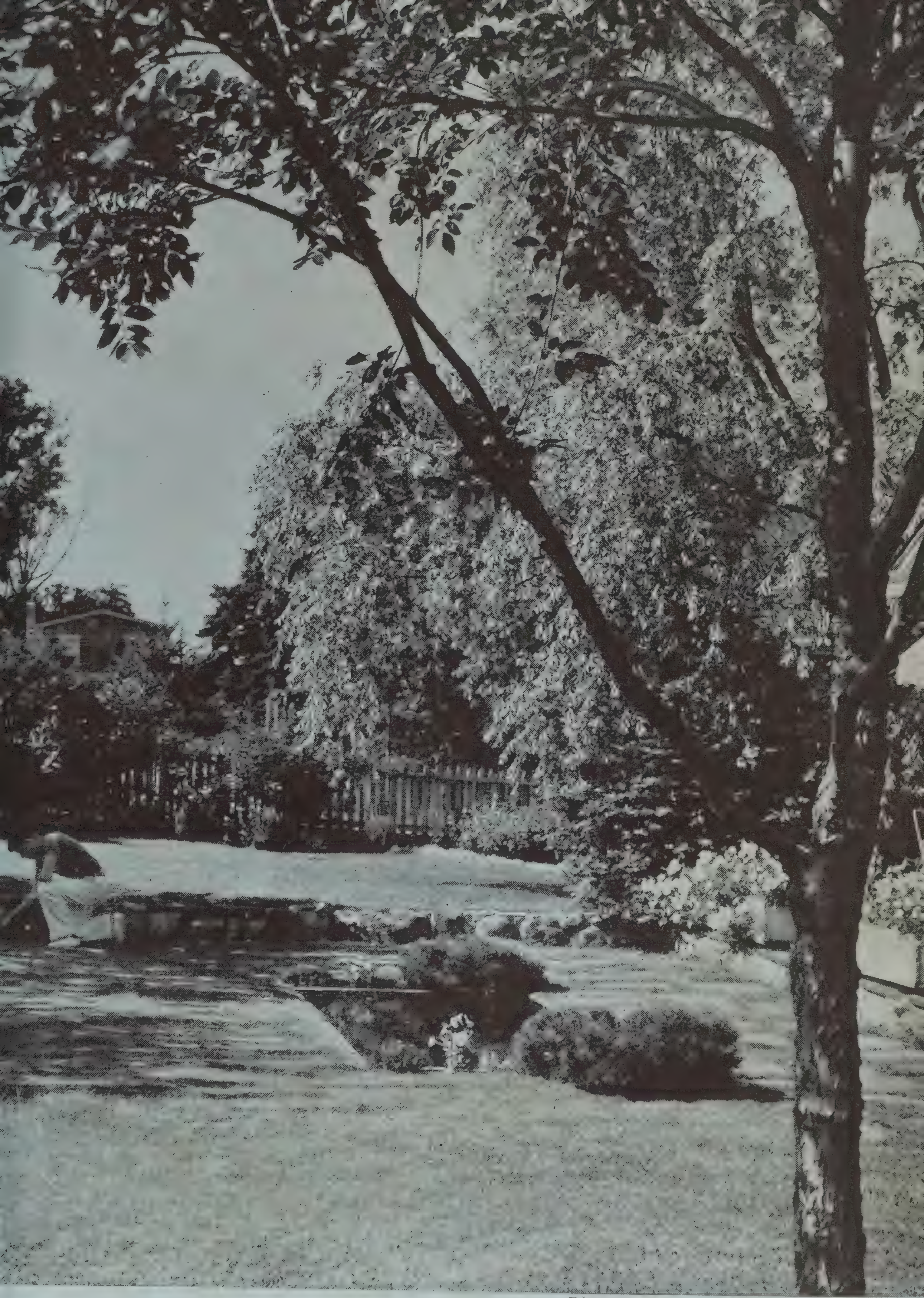
Iris dichotoma (Vesper Iris): August-flowering Manchurian species, 24″. Pinkish-violet flowers open in afternoon, fade quickly, twist spirally while fading. Profusely produced over a long period. Average soil, sun, can be raised from seed. Unusual and interesting, but inclined to be short-lived.

PAEONIA (Peony): Two main types—Herbaceous Peonies, 2′ to 3′, and Tree Peonies (shrubby), 3′ to 4′; bloom May-June, single to very double, white, yellow, purple, pink, red. Plant so that eyes are 2″ below surface in deep, rich, heavy soil. Fertilize with well-rotted manure, dried dungs, or commercial plant

Courtesy Better Homes and Gardens. Photograph by Samuel H. Gottscho

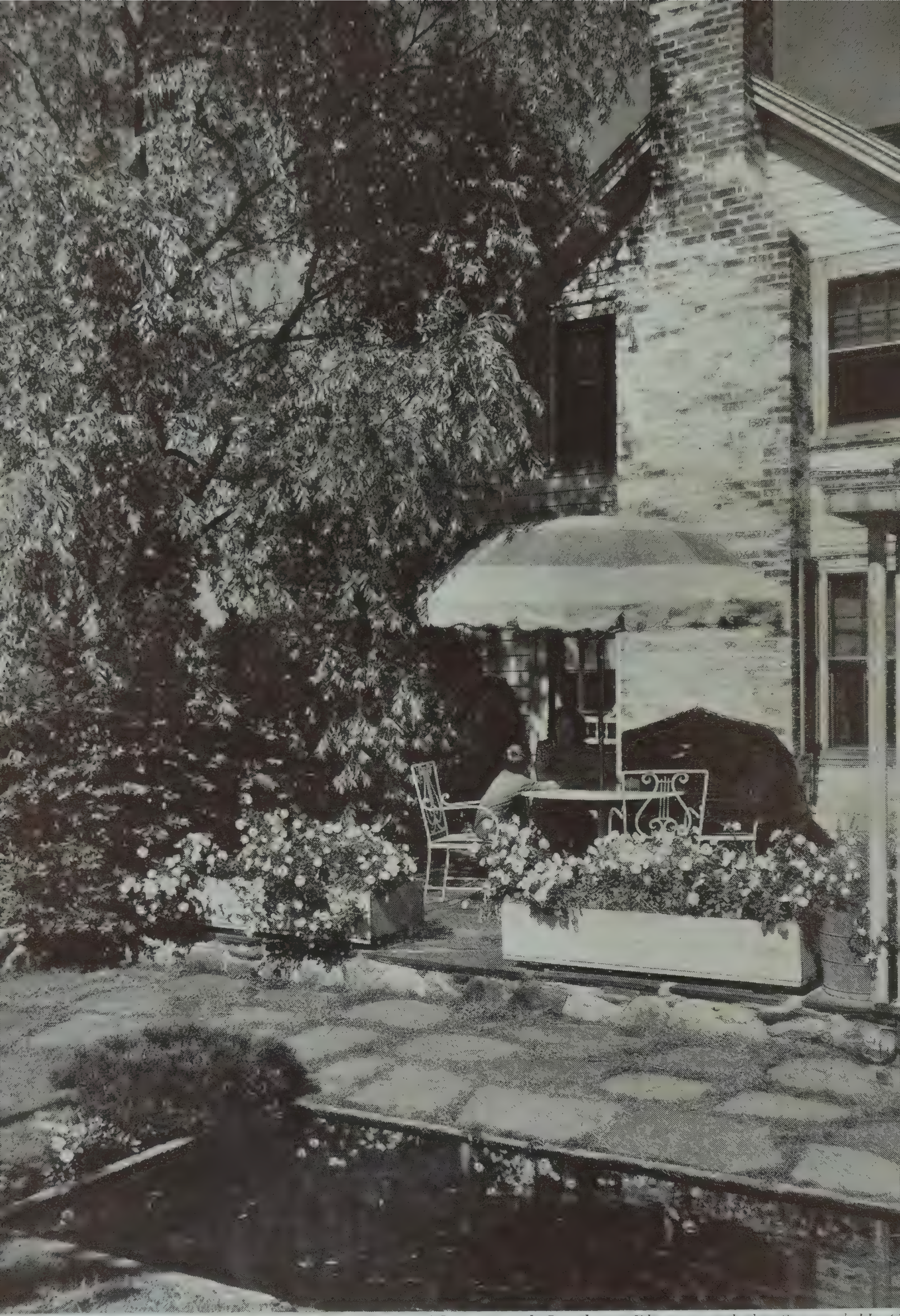
Since Apple trees do well in turf, they may often bring to small gardens the triple blessing of shade, blossom and fruit.

Courtesy Better Homes and Gardens



Photograph by Samuel H. Gottscho

A sense of spaciousness in an area actually small may be achieved by careful attention paid to scale and by unbroken stretches of good lawn. The section of the author's Long Island garden here shown is only 50′x60′.



Courtesy Better Homes and Gardens. Photograph by Samuel H. G

A western exposure such as this is ideal for a lily pool, but makes an umbrella for an unshaded terrace a decorative necessity.

food. Fresh manure is said to favor blight attacks. Disease fortunately rather rare under good soil and sun conditions; controlled by removal of affected parts, spraying with Bordeaux Mixture when shoots break through ground. Blight results in "bud-blast" and "bud-rot." Don't permit seed formation. Transplant in fall. Under good conditions, Peonies may sometimes remain contented in one spot for 20 years. For large bloom, pinch out side buds leaving only terminals; for smaller flowers but later bloom, disbud terminals. Woody species and hybrids include *P. suffruticosa* (often called *P. Moutan*), shrubby Chinese native species, 3′ to 6′, purple-flowered form sometimes offered in commerce. Variety *Banksii* is double lilac-rose; Shell Pink, 3′ to 4′, semi-double pink; Souvenir de Maxime Cornu, 3′ to 4′, yellow shaded orange. Tree Peonies rather expensive, ranging usually from $5.00 to $25.00 each.

American Peony Society rates herbaceous varieties on scale of 10. Fine double varieties (with ratings) include: Le Cygne, 9.9, fragrant white, early; Kelway's Glorious, 9.8, creamy white, mid-season; Solange, 9.7, color effect *café au lait*, late; Mrs. A. M. Brand, 9.6, white, late; Festiva Maxima, 9.3, white with crimson flecks, early; Alice Harding, 9.5, white with pink guard petals, mid-season; Therese, 9.8, pink, mid-season; Mons. Jules Elie, 9.2, pink, early; Sarah K. Thurlow, 9.1, pink, late; Phillipe Rivoire, 9.2, dark red, early; Primevere, 8.6, yellow with creamy white guard petals, mid-season. Also the following Japanese, rather similar to single types: Isani-Gidui, 9.3, white; Ama-No-Sode, 9.2, pink; Some-Ganoko, 9.0, red—all mid-season.

(Brand Peony Farms, Inc., 131 E. Division St., Faribault, Minn., is one of the best known specialists.)

Phlox (Hardy Phlox and Phlox Species): Hybrids developed from *Phlox paniculata* and other species grow 2′ to 3′ in average enriched soil, sun, constitute principal summer color in most gardens. Like manure. Plant in masses, never singly, foliage inadequate. Do not permit seeding. Seedlings usually strong but very poor color. Divide and transplant often, usually every third year, in fall. Give water when needed, but avoid watering foliage as much as possible, as it favors mildew to which Phlox is susceptible. Fine varieties include: Miss Lingard, early white; Miss Verboom, early pink; Mrs. Jenkins, late white; Mary Louise, promising new white; Daily Sketch, salmon-pink; Columbia, soft pink; Leo Schlageter, red; Augusta, promising new cherry-red; Caroline Vandenburg, lavender-blue.

(Wayside Gardens, Mentor, Ohio—largest hardy plant nursery in America, perhaps in the world—is particularly interested in Hardy Phlox.)

Phlox divaricata (Wild Phlox, Wild Sweet William): Native woodland species, 8″ to 10″, lavender-blue. Prefers rich soil, shade, but grows in sun. Blooms with Narcissus, April-May. Fragrant.

Phlox subulata (Ground Pink, Moss Pink): April-May-blooming spreading species, 4″ to 6″, requiring full sun, well-drained soil. Some harsh colors, but good varieties include: Fairy, blue; Vivid, pink; Sno-white, clean white.

Aster (Starwort, Michaelmas Daisy): Some fine hybrids developed mostly in England from American fall-blooming species. Average soil, sun. Tall types splendid for rear strip of border; low hybrids for edging or foreground. Best tall varieties include: Mammoth, 5′ to 6′, lavender; Blue Gem, 2′ to 3′, blue; Barr's Pink, 4′ to 5′, bright pink; Beechwood Challenger, 3′ to 4′, red; Mt. Everest, 3′ to 4′, white. Tall asters, in common with most tall perennials, need staking. Light Japanese cane dyed green is cheap, strong and inconspicuous. Excellent low hybrids, 6″ to 12″, include: Constance, shell-pink; Lavanda, lavender-blue; Niobe, white. Blues are of special value as that color is lacking in Chrysanthemums.

Aster alpinus: Rocky Mountain species, 6″ to 8″, is good May-June subject, especially its variety, Goliath, purplish-blue. The hybrid Aster Frikarti, Wonder of Staffa, is even better, producing large lavender-blue flowers from June to November.

(Wayside Gardens is a good source for Asters.)

Chrysanthemum (Hardy Chrysanthemum including Pyrethrum, Shasta Daisy, Field Daisy): Most valuable garden hybrids are found in this genus. To grow chrysanthemums well enrich good border soil with peat moss and cow manure, place in full sun, soak when water is needed, divide frequently.

Pyrethrum (Painted Daisy): Pyrethrums, average 24", are descended from *Chrysanthemum coccineum*, a variable Persian species which is a source of an insecticide. Easily raised from seed. Increase stock in home garden by division soon after June-July flowering. Good doubles available, including Buckey, double red; Victory, double white.

Shasta Daisy (*Chrysanthemum maximum, C. lacustre*): Most types rather coarse growing, consequently not too well suited to small gardens. Feed well. Divide often. White is the only color. Variety Silver Star is perhaps best large daisy. Double Daisy (*Chrysanthemum Leucanthemum* var. White Swan) is an interesting form of field daisy, May-June.

Hardy Chrysanthemum: Indispensable fall garden perennials. Korean hybrids, brilliant September-October flowering race developed by Alex Cumming, Jr., of Bristol Nurseries, Bristol, Conn., is slowly displacing older types. Korean hybrids transplant readily, with care even when in bud; are very hardy; have excellent foliage; and possess a luminous quality hard to translate into color terms. Among many splendid Bristol 2′ to 3′ hybrids are: Pink Lustre, exceptionally hardy orchid-pink single; Nancy Copeland, red single; Saladin, coral-red single; Indian Summer, red-orange double; The Moor, wine-red double; King Midas, soft yellow double; Lavender Lady, true lavender double (a new color in hardy chrysanthemums). Also earlier introductions including Jean Cumming, early white double; Ruth Hatton, later double white touched with lemon-yellow.

Korean hybrids are not difficult to raise from seed, which may be procured from Bristol Nurseries.)

The filler plants in a border consist to some extent of annuals and bulbs (to which we shall refer again), but mainly of perennials which form amiable combinations with the backbone genera discussed above.

For its suggestive value, let's make a color and culture list of some of the best, including vices as well as virtues. Let's go at it the hard way, without any of the Pollyanna quality one encounters in so many catalogs. Let's eliminate altogether genera not worth the effort it takes to grow any plant. Let's try—arbitrarily, to be sure—to pick the best variety or species under each genus. In other words, to help the reader select wisely for his or her special purposes, let us make an objective study of the perennial field from a garden standpoint which will constitute, with the material which has preceded it, a dispassionate (though

Moses-like) survey of hardy border plants generally available to Americans today. Hold your hat! Here we go:

ACONITUM (Monkshood): Fall-flowering tall blue; average humid soil, shade; delicately cut foliage; transplant late fall, very early spring; roots are poisonous; establishes slowly, do not move often.

Best variety: Sparks' Variety, 4′ to 5′, July-August, deep blue.

AGAPANTHUS UMBELLATUS (Blue Lily of the Nile): Summer blue, usually grown as tub plant; average soil, sun, light shade; large type not hardy; interesting and unusual accent plant.

Best variety: Agapanthus umbellatus var. *Mooreanus*, hardy with protection, 18″, June-July-August, deep blue.

ALLIUM (Garden alliums, related to onion, leek, garlic): Summer flowering low lavender; bulbous; average soil, sun; foliage inadequate; unusual for border. Chives (*Allium Schoenoprasum*) has interesting purplish flowers.

Best species: Allium albopilosum, 12″, deep lilac. Grow it like any old onion.

ALYSSUM (Basket of Gold, Hardy Alyssum): Spring-flowering low yellow; average well-drained soil, sun; weedy-looking.

Best variety: Alyssum saxatile var. *Citrinum,* 10" to 12", April-May, lemon-yellow.

AMSONIA (named for Dr. Charles Amson, but sometimes called Ansonia): Early summer medium height blue; native; average soil, sun.

Best species: Amsonia Tabernaemontana, 2' to 3', May-June, terminal panicles of light blue.

ANCHUSA (Alkanet, Italian Borage): Summer flowering tall blue, spring flowering low blue; well-drained soil, sun; tall types coarse but good; will flower intermittently if seeding is prevented.

Best tall species: Anchusa italica, 3' to 5', June-September, bright blue; its variety Dropmore prefers light shade, has loose heads of purplish-blue.

Best low species: A. myosotidiflora—also listed as *Brunnera macrophylla*—12", May-June, bright blue. First-rate.

ANEMONE JAPONICA (Japanese Windflower): Late fall flowering medium height pink, white, rose. Pleasant and delicate fall contrast. Average well-drained soil, sun or light shade, water freely in dry spells; transplant in late spring; improves with age but light winter protection recommended; many fine hybrids.

Best variety: September Charm, 18" to 24", September-November, rose-pink.

ANTHEMIS TINCTORIA (Chamomile): Summer flowering medium height yellow. Average soil, sun; weedy, but good for cutting.

Best variety: Moonlight, 24″, June-September, pale yellow.

Anthericum Liliago (St. Bernard's Lily): Late spring flowering lily-like white. Rich, well-drained soil, sun, light shade; water freely in dry spells.

Best variety: A. Liliago var. *major,* 24″, May-June, white.

Aquilegia (Columbine): Spring flowering medium to low height, all colors. All species and hybrids good. Long-spur types wonderful for cutting. Light soil for hybrids; heavy soil for species. For both, add humus to soil. Sun or light shade, flowers holding color better in light shade. Occasional attacks of leaf-miners, controlled by cultivation.

Best types: All good, but Wayside Giants and Dobbie's Imperials are grand hybrids. Best species perhaps long-seasoned *A. chrysantha.* Foliage of all is decorative. Should be used by the dozens in border foreground. Short-lived, but easily raised from seed.

Armeria (Sea Pink, Thrift): Summer flowering low hard pink; tufted evergreen foliage. Any sandy soil, sun.

Best variety: Only armerias worth growing are Wayside Tall Hybrids, 18″ to 24″, June-October, white, pink, rose-purple.

Artemisia (Southernwood, Sagebrush): Gray foliage plant; inconspicuous yellow flowers of no importance. Variety Silver King much used in flower arrangements. Any well-drained soil, sun.

Best species: Shrubby Southernwood, *A. Abrotanum,* 3′ to 5′, silvery-gray foliage aromatic.

ASCLEPIAS TUBEROSA (Butterfly Weed): This species of milkweed is worth growing for its flowers; foliage skimpy; any well-drained soil, sun; 24″, July-August, umbels of bright orange.

ASTILBE (Spirea): Summer blooming medium height white, pink, purplish pink. Deep rich soil, copious supply of water during growing season, sun, shade. Often confused with *Aruncus sylvester,* the Goat's Beard, which it greatly resembles. Handsome compound foliage. Most colors are rather washed out.

Best variety: Granat, 2′ to 3′, June-July, salmon-red.

BAPTISIA AUSTRALIS (False Indigo): This June flowering native species has good foliage, responds to feeding. Average soil, sun, 2′ to 3′, terminal racemes of lupine-like flowers, indigo-blue.

BEGONIA EVANSIANA (Hardy Begonia): With light winter protection this pink, 24″, begonia is hardy—the only one which is. In cultivation since 1804, for a time forgotten, now generally available. September-October flowering, valuable in shade. Even more useful for bright colors in shade are Tuberous-rooted Begonias (*Begonia tuberhybrida*). One of the best known specialists in begonias is Howard R. Rich, Atlantic, Me.

Belamcanda chinensis (Pardanthus, Blackberry Lily): Old fashioned species, 2′ to 3′, belonging to Iris family; rich sandy loam, sun; black seeds suggest blackberries, flowers orange spotted red.

Bellis perennis (English Daisy): Spring flowering low pink, white; species, the true daisy; medium moist soil, sun; perennial but better handled in this country as biennial, sowing seeds about August 10, carrying over winter in cold frame, setting out young plants in early spring.

Campanula (Bellflowers): Summer blooming low to medium height blue, white—biennials also pink. Average enriched soil, sun, partial shade. Canterbury Bells (*C. Medium*) and Cup-and-Saucer form (var. *calycanthema*) grown as biennials, or as annuals started very early under glass. Hardy perennial types of great garden value.

Best sorts: Low—*Campanula carpatica,* 8″ to 12″; tall—*C. persicifolia* var. Telham Beauty, 24″ to 30″, both June-July, blue; tallest—*C. pyramidalis,* June intermittently all summer, blue, white (var. *alba*).

Caryopteris incana (Blue Spirea): A shrub treated like a herbaceous perennial, because it kills back to ground in winter, sends up new shoots from roots in spring. Winter protection recommended. Tall, 2′ to

5′, average sandy loam, sun; September-October, blue, pink, white.

CASSIA MARYLANDICA (Wild Senna): Late summer tall yellow. Good light green foliage. Rich humid soil, sun; 3′ to 4′, July-August-September.

CATANANCHE CAERULEA (Love Plant): Midsummer medium height deep blue. Average well-drained soil, sun; 24″, June-July-August. In ancient times plant was used in compounding love philters.

CERATOSTIGMA PLUMBAGINOIDES (Plumbago Larpentae): This Chinese species is valuable late low blue; interplanted with *Vinca minor* furnishes excellent spring and fall blue edging. Not reliably hardy north, recommend winter covering. Well-drained sandy loam not too heavily enriched; 6″ to 8″, September-October, spreading, good deep blue.

CLEMATIS (Shrubby Clematis): Often overlooked but interesting border subjects. Prominence of exquisite large-flowered hybrids in same genus overshadows them. Need well-drained loam, containing lime; sun, light shade; cut back to soil in late fall, mulch with well-rotted manure or spent mushroom soil.

Best variety: Clematis heracleaefolia var. *Davidiana,* 3′ to 4′, requiring light support; clustered heads in August-September of fragrant flowers, bright blue. Not spreading.

Convallaria majalis (Lily-of-the-Valley): Well-known herb, prized for white, bell-shaped, very fragrant spring flowers, arising from horizontal rootstocks (called pips). Moderately rich soil, sun, shade, shade preferred. Best results when bed is top-dressed each fall, and completely made over with strong new pips every fourth or fifth year. Clean foliage makes ground cover under trees or in other shady places.

Delphinium (Hardy Larkspur): Medium to tall summer flowering blue. White, pink, purple, red, yellow available but the unsurpassed blue, especially of some of the hybrids, is the reason for the plant's great popularity. Deep rich sandy loam, neutralized with lime; all types improved by staking; increase by crown divisions in fall, or grow from fresh seed of superior strains available in August.

Best for cutting: Light blue Belladonna types, or new variety, Pink Sensation.

Best low variety: D. grandiflorum var. *chinense,* 2′ to 3′, finely cut foliage, gentian-blue.

Best tall hybrids: The best hybrid delphiniums in the world today, I believe, are grown by Col. Edward Steichen, artist-photographer, president of American Delphinium Society. He is not yet ready to release either seeds or plants. However, many fine strains are available—Sutton's, Wayside, Blackmore & Langdon, Duckham's, Hood's—and every lover of the plant should try to raise some from a specialist's handpollinated seed. A strong, mildew-resistant strain may be procured from Vetterle & Reinelt, Capitola, California. Due to hot American summers, delphiniums at present are with us short-lived perennials. Chief enemy is cyclamen mite (cause of "bud-blasting" and "blacks"); principal source of fungus trouble is mildew. Spraying weekly with Triogen, or other good spray, is helpful; but best control is destruction of affected plants.

DIANTHUS (Pinks): Summer flowering low, fragrant white, red, pink. Known species number about 250, including those with yellow and lavender flowers, but only about 8 types are generally available in commerce. Both biennial Sweet William (*Dianthus barbatus*) and florists' and garden carnations, developed principally from *D. Caryophyllus,* belong to the genus. All types easily raised from seed. Soil should be well-drained and limed; sun; many tend to be continuous flowering.

Best varieties: Hardy Carnation, Crimson King, red; *D. latifolius* var. Beatrice, pink; *D. plumarius* var. White Reserve, white.

DICENTRA SPECTABILIS (Bleeding Heart): Spring flowering medium height rosy-red. Well-drained but *humid* soil, sun, shade; beautiful foliage which will remain in good condition until late summer when plant gets enough moisture. (*Dicentra eximia* has already been mentioned as a valuable edging plant; especially good in shade.)

DICTAMNUS ALBUS (Gas Plant, Fraxinella): Summer flowering medium height rosy-pink, white. Rich well-drained loam, sun; establishes slowly but is very long-lived; lemon-like odor.

Best variety: Larger than the type is *D. albus* var. *caucasicus*, 2′ to 3′, June-July.

DORONICUM (Leopard's-bane): Early spring medium height bright yellow. Rich loamy soil, sun, partial shade; foliage disappears during July-August.

Best species: D. caucasicum, flowers larger than others.

DRACOCEPHALUM (Blue Dragonhead): Rarely grown but easily raised, 18″ to 24″, July-August, blue. Valuable for time of flowering. Humid, well-drained loam, shade.

Best variety: D. Ruyschiana var. *japonicum*, 24″, flowers white shaded blue.

ECHINOPS RITRO (Globe Thistle): Another good July-August perennial, 2′ to 3′, thistle-like, steely blue. Average soil, sun, light shade. Flower heads can be dried for winter decoration.

Best variety: E. Ritro var. *tenuifolius* has lower leaves more narrowly cut than the type.

ERIGERON (Fleabane): Summer flowering, aster-like medium height blue. Average humid soil, sun.

The species *E. aurantiacus* has bright orange flowers, 9″, but most are taller with purplish-blue rayed blossoms.

Best species: E. speciosus, 18″ to 24″, June-July, violet with yellow centers. Easier to grow and good substitute for *Aster subcaeruleus* which it much resembles.

ERYNGIUM (Sea Holly): Midsummer flowering medium height metallic blue. Average sandy soil, sun, does well near seashore. Something like Globe Thistle, but stems and bracts as well as blossoms are blue or silvery. Can be dried for winter decoration. Self-sows.

Best species: E. amethystinum, 18″ to 24″, July-August, blue.

EUPATORIUM (Hardy Ageratum, Mistflower): Late summer medium height blue, white. Spreading, slow to appear in spring; average soil, partial shade. Tall rank types, such as Joe-Pye Weed (*E. purpureum*), good for wild places but not for border.

Best species: E. coelestinum, 12″ to 18″, August-October, violet-blue. Good cut flower.

FUCHSIA MAGELLANICA (Hardy Fuchsia): Interesting variable shrub species for north side of house or other shady situation. Rich, well-drained loam, protect in winter with straw or glass-snow north of Philadelphia. In bloom all summer, pendulous ruby-red.

GAILLARDIA (Blanket Flower): Only two hybrid perennials in the genus seem to me worth growing, but they are very fine—Ruby, ruby-red; and Sun God, soft yellow. Rich, light soil, must be well-drained, sun; withstand drouth exceptionally successfully; 18″ to 24″, continuous flowering, June-November.

GALEGA OFFICINALIS (Goat's-rue): Little known but easily grown July-August, 2′ to 3′, purplish-blue. Average enriched soil, sun.

GERANIUM (Crane's-bill): Do not confuse with zonal, or florists', geraniums which belong to the genus Pelargonium and are tender. Of the 250 species of the true Geranium many are hardy and several are good garden flowers. Ordinary light soil, sun; slow to establish.

Best species: Geranium ibericum, 12″ to 18″, July-August, violet.

GEUM (Gums): Summer more or less continuous flowering low to medium height yellow to red-orange. Add humus to soil, sun, light shade. Should be massed to be effective.

Best variety: Fire Opal, 18″ to 24″, May-October, red-orange.

GYPSOPHILA (Baby's-breath): Dainty summer flowering medium height white (or pink). Any well-drained soil, add lime. Full sun. Delicately contrasting, but a big plant. For *Gypsophila paniculata* allow as much space as a peony, a circle 3′ in diameter.

Best variety: Bristol Fairy, 2′ to 3′, double white, continuous flowering if fading shoots are cut off near base. Rosy Veil is an interesting double pink.

HELENIUM (Sneezeweed): Somewhat coarse, easily raised late summer flowering yellow to orange. Ordinary light soil, sun.

Best variety: Peregrina, July-August, 3′, mahogany with yellow edges.

HEMEROCALLIS (Day-lily): Among the very best herbaceous perennials. Remarkably free from enemies. By use of different varieties or species may be had in flower from spring to fall. Colors generally yellow to orange, but hybrid forms of white, pink and other tints, developed chiefly by Dr. A. B. Stout, should soon be generally available. Called day-lilies because each blossom lasts but a day and is then replaced by another. Any soil, sun, shade.

Best varieties for general use: Dr. Regel, 18″, orange, May-June; Lemon Lily (*H. flava*), 18″ to 24″, very fragrant yellow, June; Gypsy, 2′ to 3′, orange, July; Hyperion, 3′ to 4′, lemon-yellow, July-August; Mrs. W. H. Wyman, 3′ to 4′, lemon-yellow, August. Many others.

HESPERIS MATRONALIS (Sweet Rocket, Dame's Violet): Nice old-fashioned fragrant flower, suggesting a meager phlox, white to lavender. Any soil, sun, shade. Self-sows and often escapes. White inclined to be muddy, 24″ to 30″, June-August.

HEUCHERA (Coral-bells): Spring and summer flowering low white, pink, red. Attractive basal leaves, graceful little flowering shoots (scapes). Fairly rich but well-drained soil, sun.

Best species: Heuchera sanguinea, 12″ to 15″, June-September, crimson. Variety *Rosamundi* is an especially good blight-resistant coral-pink.

HOLLYHOCKS: Well-known, short-lived perennial inclined to be biennial. Length of life depends to considerable extent on soil and situation, as does its ability to resist rust which commonly attacks it. Developed from Chinese species, *Althaea rosea,* hollyhocks are now grown all over the world, are available in single and double forms in white, yellow, pink, red. Mixed seeds produce all colors save blue. Deep rich well-drained soil. Full sun.

Best propagated from seed. Good strains come about 75 per cent true. Sow in June, July, August in fairly heavy soil so that side roots instead of deep taproot will be formed. Transplant seedlings the following spring to permanent positions, being careful not to injure roots, to place them pointing down, and to set crown a couple of inches *below* surface of the ground. Plants so set out live longer, resist disease better. Height 6′ to 8′, sometimes 10′. Staking advisable. Hollyhocks self-sow freely, occasionally escape.

Best variety: If forced to choose only one, I'd vote for Sutton's Prince of Orange, July-August, 5′ to 6′, apricot double.

INCARVILLEA (Trumpet Flower): One species of this exotic relative of the Bignonia is a perennial herb which is a startling addition to the border foreground. It is *Incarvillea Delavayi,* producing from deeply cut somewhat coarse basal leaves scapes 12″ to 24″ tall, each of which bears from 2 to 12 large rosy-purple trumpet-like blossoms. Deep rich well-drained soil; more than average winter protection; full sun. Best planted in very early spring.

KNIPHOFIA (Tritoma, Red-hot Poker): Wonderful hybrids for accent, rarely for massing, have been developed. Good average well-drained soil, sun. Average height 2′ to 3′.

Best varieties: Goldmine, July-August, brown tinted yellow; *Pfitzeri,* August-September, red-orange tinted yellow; Towers of Gold, August-September, golden yellow.

LAVANDULA (Lavender): Midsummer flowering medium height aromatic, gray-leaved, blue. Slightly enriched sandy soil, sun. Both True Lavender (*L. vera*) and a dwarfer variety (called variously *compacta* or *nana*), which blooms several weeks sooner than the type, are first-rate garden subjects. Average height 2′ to 3′ for dwarf, 3′ to 4′ for true type; flowers in July-August. To prevent too scraggly appearance, trim back in March or April by 6″ to 8″, or more.

LESPEDEZA SIEBOLDII (Desmodium): Late medium height purple. A shrub which dies back in the north, sends up new shoots from the crown, blooms in September. Cut back to soil line in early spring. Tolerant of soils. With age, makes large specimen. Interesting for rear of border.

LIATRIS (Blazing Star, Gay-feather): Midsummer tall native rosy-purple. Any soil, sun, shade. Thin, spiky. Small groups provide startling accents.

Best species: L. pycnostachya, 3′ to 5′, July-August, purplish.

LINUM (Flax): Summer blooming low bright blue, white, yellow. Enriched sandy soil, good drainage essential, sun. Leaves inadequate; plant in masses in foreground, masking bases of plants with sturdier foliage of other perennials. Remove shoots which have finished flowering to induce thicker growth.

Best species: Linum perenne, 12″ to 18″, May-June, azure-blue.

LITHOSPERMUM (Gromwell): Midsummer low blue, thought by some to be as good as the blue of gentians. Rich well-drained soil, no lime. Woody, something like *Daphne Cneorum,* and sprawling. More often used in rock garden than border.

Best variety: L. prostratum var. Heavenly Blue, 6" to 8", July-August.

LUPINUS (Lupine): Summer flowering medium height pink, red, yellow, especially blue. Does not transplant readily; best to sow seed where wanted. No lime; acid soil (pH 6.0) therefore don't grow near Delphiniums, for instance. Very handsome plant. Russell Lupines sensational success in England. With me disappointing, but lack of enthusiasm may not apply to you. Try them.

Best species: Lupinus polyphyllus, 2' to 5', June-September, deep blue.

LYTHRUM SALICARIA (Purple Loosestrife): One variety, *roseum superbum,* is a first-rate accent plant. Thrives in ordinary soil, prefers but does not demand moisture, sun or shade, 4' to 6', July-September, bluish-rose (magenta, if you like, which is a good color when properly balanced). I have grown this plant successfully 3' to the north of a 16-foot Douglas Fir, which speaks well for its sturdiness.

MERTENSIA VIRGINICA (Virginia Bluebells): Beautiful wildflower, native to northeastern America. In the wild usually found in low ground, but will grow in open border. Foliage ripens and disappears soon after flowering so that, in the border, location must be masked by plants with sounder foliage. Often naturalized with narcissi. Ordinary soil, sun or shade, 1′ to 2′, March-May, pink buds and porcelain-blue flowers.

MONARDA DIDYMA (Bee Balm, Horsemint, Bergamot, Oswego Tea): Midsummer medium height white, salmon, red. Attractive to humming-birds, but coarse and fast-spreading. Good in wild garden, though *Lobelia cardinalis* in same setting would probably be better. Ordinary soil, sun, shade. Aromatic.

Best variety: Perry's Variety, 2′ to 3′, June-July, deep amaranth-red.

NEPETA MUSSINI (Catmint): Low spring flowering lavender-blue. Sterile or ordinary soil, well-drained; full sun; blooms again if fading flowering shoots are removed.

Best variety: Six Hills Giant, more upright and larger than the type, 8″ to 12″, May, usually again in September.

OENOTHERA (Evening Primrose, Sundrops): Late summer low to medium height yellow. Ordinary enriched soil, well-drained, sun, light shade.

Best variety: Oe. fruticosa var. *Youngii*, Young's Sundrops, 18″ to 24″, June-July, lemon-yellow.

PAPAVER NUDICAULE (Iceland Poppy): Summer flowering, delicate tinted cups on leafless stems, yellow, orange, white, pink. Moderately rich light loam.

Good for cutting; remove seed pods for continuous flowering. Evergreen foliage on ground. Short-lived.

Best variety: Schinzianum, slightly larger and taller than the type, perhaps 12″, burnt-orange.

Papaver orientale (Oriental Poppy): Late spring (May-June) 2′ to 3′, orange, salmon, pink, white, brilliant red. Adapts itself to various soils, rich well-drained loam best; long-lived. Transplant potted plants only in spring; field-grown plants in August-September only. Propagated by root cuttings.

Best varieties: Choose by color preference. Among high rankers are Fairy, shrimp-pink; Mrs. Perry, warm apricot.

Pentstemon (Beardtongue): Summer flowering medium height white, blue, pink. Like miniature foxgloves, very graceful. Deeply prepared, rich but well-drained soil; full sun. Hardier than generally supposed. California species *P. heterophyllus,* 3′ to 4′, June-July-August, is good cut flower, interesting blue.

Best variety: P. barbatus var. Pink Beauty, 24″, June-July, shell-pink.

Perovskia atriplicifolia (Russian Sage): A shrub with silvery-gray foliage, related to Salvia. Well-drained, loamy soil, sun; dies back during winter in north; root-hardy. Valuable for late flowering and distance effect of foliage. Blooms August-September, 4′ to 5′, terminal panicles of blue.

PHYSALIS FRANCHETII (Chinese Lantern): Interesting red-orange fruits which may be gathered as soon as colored, dried, and used for winter decoration. Average soil, sun, shade. Usually short-lived.

PHYSOSTEGIA (False Dragonhead): Late summer tall to medium height bluish-pink. Average enriched soil, sun. Spreads rapidly, divide frequently.

Best variety: Vivid, 20", August, dwarfer than the type, deeper pink.

PLATYCODON GRANDIFLORUM (Chinese Bellflower, Balloonflower): Late summer flowering low to medium height white, blue. Variety *Mariesii* is dwarf. Establishes slowly, appears late in spring. Needs inconspicuous staking, except *Mariesii.* After first bloom, cut back halfway for bloom on laterals but no farther. Stalks should die down naturally, like bulb foliage, to avoid injury to delicate growing points. Average loamy soil, *well-drained,* sun, light shade. Under proper conditions as good a plant as its biennial relative, Canterbury Bells, and more reliable. Best moved in spring just as growth starts. Can be propagated by careful division of turnip-like root stock, or easily raised from seed. Excellent interplanted with Narcissus, as its foliage appears just when Narcissus begins ripening.

Best variety: P. grandiflorum var. *album,* 20", June-July, again if trimmed back, and seeding not permitted.

Polemonium (Jacob's Ladder): Summer flowering low to medium height white, blue. Average enriched well-drained soil, sun—except woodland native, Greek Valerian (*P. reptans*) which prefers shade.

Best variety: P. Richardsonii var. *caeruleum,* 18″, June-July, bright blue.

Primula (Hardy Primrose): Spring flowering low shade-loving white, pink, rose, red, blue, yellow. Large genus containing tender and hardy types, virtually all beautiful. Damp but well-drained soil, shade necessary to many; but hardier types can be grown under deciduous trees when soil is prepared with leafmold and manure. From fresh seed, not difficult to raise. Worth playing with if your garden provides any shade at all.

Best variety: Duplex, or hose-in-hose, type of Bunch Primrose (*P. Polyantha,* often listed as Polyanthus) soft yellow. Also very fine for average garden is Munstead Strain, said to have originated in gardens of Gertrude Jekyll, yellow, cream, orange, pink, rose. Polyanthus easily raised from seed, easily propagated by division of established clumps. Average height 10″.

Roses: As a general thing, Roses—particularly Hybrid Teas and Hybrid Perpetuals—are grown in separate beds of heavy soil, richly manured and carefully under-drained, but a few types combine rather well with herbaceous perennials, notably: Hardy Climbers, on walls or fences at the back of a border;

hybrid Rugosas, in the background, Shrub Roses, as accent or contrast plants; and low ever-blooming Polyanthas, especially improved sorts called Floribunda roses, in the border foreground.

Of particular interest are the Horvath Hybrids now being introduced. These are bred for hardiness and clean foliage, resistance to insect and disease, as well as good blossoms. So far, in limited colors.

RUDBECKIA (Coneflower): Most of these are weedy perennials or biennials. Black-eyed Susan (*R. hirta*) is nice, but a biennial. However, *Rudbeckia speciosa* (often called *R. Newmanii*) is very similar and perennial. Any soil, sun, shade, 3′, flowering all summer, orange-yellow with purple disk.

Practically always listed under Rudbeckia in catalogs is the Purple Coneflower, which botanists call *Echinacea purpurea* var. *serotina*. This is a worth while plant: July-October, 2′ to 3′, rays purple, disk cone-shaped, prominent and brown.

SALVIA (Blue Salvia): The best of the perennial blue sages is probably *Salvia farinacea*, summer, 24″; or the darker blue later-blooming *S. azurea* var. *Pitcherii*. The best color—in fact one of the best blues in the plant world—is *S. patens*, 1′ to 2′. But it's only half-hardy, is therefore usually grown as an annual, and its flowers are few and far between. Average soil, sun.

ACC No......1080

SCABIOSA CAUCASICA (Blue Bonnet): Summer flowering medium height lavender. Sandy loam, or average good soil when well-drained; full sun. Skimpy foliage, good cut flower. Blooms June-July-August, 18″ to 24″.

SCUTELLARIA BAICALENSIS (Skullcap): Low late summer blue. Flowers like little snapdragons; unusual and nice. Enriched sandy loam, full sun; 12″, July-August.

Best variety: Slightly larger than the type is var. *coelestina,* bright blue.

SIDALCEA MALVAEFLORA (Greek Mallow): Summer flowering medium height purple, pink. Better plant for small gardens than the giant Rose Mallow (*Hibiscus Moscheutos* hybrids), which need a moist soil. Greek Mallows succeed in any soil, full sun.

Best variety: Rosy Gem, 2′ to 3′, June-July, suggests a dwarf hollyhock, pink.

STACHYS OFFICINALIS (Betony): Midsummer medium height purple. Any good soil, sun.

Best variety: Larger than the type, *Stachys Betonica grandiflora,* 2′ to 3′, June-July-August, rosy-purple.

THALICTRUM (Meadow Rue): Summer flowering dainty medium height purple, white, yellow. Average good soil, well-drained, sun or light shade.

Best species: Thalictrum aquilegifolium, June, leaves like the Columbine, flowers suggest an early mistflower, 2′ to 3′, rosy-purple.

Tradescantia (Spiderwort): Summer flowering low blue-violet. *T. fluminensis* is one of the florists' Wandering-Jews. A fleshy but erect member of the genus is *T. virginiana,* 12″ to 15″, flowering all summer, sun or shade, any soil.

Best variety: James C. Weguelin, June-September, porcelain-blue.

Valeriana (Valerian, Garden Heliotrope): Summer flowering medium height muddy rose-purple, very fragrant. Easy to grow. Average soil, somewhat moist preferred, sun.

Best species: Hardy Garden Heliotrope, *Valeriana officinalis,* spreading by suckers, not very handsome, June, 3′ to 4′. Well worth inclusion in gardens for its delightful odor.

Verbascum (Mullein): Hybrids are interesting English developments. Colorful and showy. Dry, sterile soil, or average soil when well-drained. Inclined to be biennial; self-sow freely.

Best variety: Cotswold Gem, 3′ to 4′, July-September, amber-purple.

Veronica (Speedwell): Midsummer flowering low to medium height white, blue. Some excellent hybrids. One of the most valuable of hardy blues. More or less continuous flowering if not permitted to set seed. Average good soil, sun, likes lime (give bonemeal). Divide often.

Best varieties: Blue Spires, 24", spikes of deep blue, June-July. Also fine is *V. longifolia* var. *subsessilis* which needs deep rich humid soil, 2′ to 3′, August-September, very deep blue.

VIOLA (Viola, Violet, Pansy): *Viola cornuta,* the Horned Violet, crossed with the Pansy (*V. tricolor*) has produced the modern profuse-flowering Viola. Violas stand hot weather rather better than pansies, but are inclined to be biennial and are at best short-lived perennials. They are beautiful low plants, propagated readily from runners produced as flowering diminishes, or they can be raised from seed. Rich well-drained soil, sun or shade; light shade preferred.

Best variety: Sutton's Apricot, one of the loveliest small flowers in existence. Blooms from early spring to late summer and, if seeding is prevented, to fall.

Sweet violets are derived from *V. odorata* and generally prefer shade. For violets, violas and pansies (the latter two are usually grown as biennials or as annuals by an early start under glass) the soil whether in sun or shade should be humid.

Best Pansy: Roggli's Cardinal Shades, like red velvet.

Best Sweet Violet: Rohrsbach's Perpetual.

VITEX AGNUS-CASTUS (Chaste Tree): A shrub, to 10′, hardy as far north as New York and thriving in any well-drained soil. Suited for the shrubbery, it is at the same time so graceful and is in flower for such a long period, July-September, that it makes a grand border subject. Deeply cut gray-green foliage; buddleia-like grayish-lavender flowers. Can by judicious pruning be held back to around 6′ to 7′.

Vines are important in softening harsh lines, in relieving dull, flat spaces on masonry or fence, in enlivening with their shadow patterns otherwise monotonous wall stretches, and in underplanting.

But—and this is an injunction worth heeding—never plant a vine unless you're prepared to control it. Even the best of them, once they're established, will race through your borders, strangle your shrubs, and run away with your house—unless hard-boiled use of the shears constrains them from such anti-social behavior. Only two types of landscapes are entirely acceptable, anyway. One is completely untouched by man; the other is completely dominated by him.

Not more than a dozen types of vines are worth the trouble it takes to make them conform to the gardener's wishes. Grapes, English Ivy, *Ampelopsis heterophylla* var. *amurensis* (for its blue fruits and striking fall color), Silver-lace Vine (*Polygonum Aubertii*), Climbing Hydrangea (either *Hydrangea petiolaris* or *Schizophragma hydrangeoides*, very similar in habit and appearance), Clematis—in particular the large-flowered hybrids—and Wisteria: these are worth what they cost.

And so are Climbing Roses which, of course, don't climb at all. However, when tied in position, they act as though they did. Never plant Climbers where people are likely to congregate, around porches or other places where their thorns can snatch at dresses or start runs in silk stockings. In such situations, the plants don't get the ventilation they should have for healthiest progress; correct spraying becomes difficult; and their foliage, due mainly to excess moisture from gutters, is more than ordinarily subject to slug attack. Put them out in the garden where they may be admired from a safe distance. Prune them wisely, remembering that in general small-flowered types blossom on new wood and large-flowered sorts on old wood, and they will delight you.

If you want fruit, one thing is essential in Grape training: do not remove all the current year's wood. Fruiting canes arise from wood made the previous season. While the vine is dormant, therefore, cut back the summer wood (light in color) to 3 to 4 buds. These buds the following year will send out grape-bearing shoots.

Silver-lace Vine should be pruned while dormant. Unless the work is done in winter or very early spring, heavy cutting back may injure the vine. It blooms twice, spring and fall, and will do well in a northern or eastern exposure. The light trimming involved in using the blossom for cut flowers does no harm.

Many named varieties of Hybrid Clematis are absolutely magnificent, nor are they unruly for growth averages 8 to 12 feet. However, the hybrids do insist upon careful soil preparation, careful planting, careful attention to watering during the first summer, careful winter protection the first winter. The hole should be 2 feet in diameter, 2½ to 3 feet deep. Six inches of drainage material should go into the bottom. Fill the remainder with a rich compost of topsoil and cow manure. The soil should be distinctly alkaline (pH 7.5) so *add lime*. Set crowns 3 inches below soil surface. Eastern exposure preferred. Protect crown with light mulch of straw or glass-snow the first winter. A growing interest in hybrid Clematis is noticeable with the result that excellent ones are becoming more generally available. At "Oak Hill" in Aldie, Virginia, the home at one time of President James Monroe, a remarkable garden is being made. In it more than 250 different varieties of hybrid Clematis are planted, one of the largest collections in this country. The owner of this garden recommends as the best hybrid for withstanding hot summers the very large-flowered, rose-pink Duchess of Albany.

To insure free flowering, buy a good grafted Wisteria from a reliable dealer. Start it in a generous hole of topsoil enriched with bonemeal. A winter dressing of old manure will prove beneficial. Give it sturdy support. Train direction of terminals carefully. Tie them in place with raffia at intervals of 6 to 8 inches. Like Grape, flowering shoots spring from wood made the year before, although scanty flowers are borne on new wood in July. For main May bloom, therefore, prune back laterals—usually in July-August—to three eyes (buds). These stubs are known as spurs. The plant does very well for itself when untrained, too, but it does get into terrific, though picturesque, tangles.

Wisteria has everything: hardiness, vigor, clean foliage, obedience to training, natural grace, fragrance. Can any gardener ask for more?

Summary of Chapter VI: *Many hardy herbaceous perennials are long-lived, but perennial does not mean perpetual. Plants must be divided and divisions replanted in fresh earth, when growth signals need for change. Most perennials may be divided after flowering has ceased. For convenience, the bulk of this work is usually done in the fall.*

Division is one way of increasing stock. But some good perennials may be raised from seed, or multiplied by rooting cuttings in shaded, wet sand. Modern routine involving chemicals raises the percentage of success, while a propagation box lessens trouble of handling a small number of cuttings for home gardens.

Named varieties of shrubs and perennials are almost invariably propagated vegetatively, enabling gardens everywhere to be planted to superior types. For the sake of accuracy, practical *information and intellectual interest, gardeners should be familiar not only with horticultural varieties but with the botanical names of at least the principal genera and species.*

Next are supplied detailed results of an objective survey from the garden standpoint of hardy border material generally available to American garden makers today. The study covers 86 genera, eliminates material requiring too meticulous care or not worth growing, furnishes information on color, height, blooming period, soil and exposure requirements, cultural practices, best varieties and species.

Vines are important for certain purposes but not one should be planted unless you're prepared to control it. Good vines for garden projects are relatively scarce anyway. Included among excellent ones are Grape, English Ivy, one variety of Ampelopsis, Silver-lace Vine, Climbing Hydrangea, Hybrid Clematis and—as Number One—Wisteria.

CHAPTER VII

HOW TO MAKE THE MOST OF ANNUALS

What They Are and Why They Are Needed; To Raise a Great Many Is Burdensome; Practical Means of Acquiring Annuals in Quantity for Combination with Perennials; Bedding Annuals in Modern Style; A List of Varieties Especially Useful in the Mixed Border, Arranged by Colors; Summary.

Annuals are one-season plants. Their natural function is to grow fast, make seed so as to perpetuate their kind, and die.

Gardeners, of course, don't allow them to seed;

and in consequence, when the soil in which they're grown is light and well-drained and well-fed and the plants receive as much moisture as they need—which is often an appreciable amount on the water bill—they flower furiously. They're not expensive. They bloom from an early spring start at a time calculated to bridge the gap between the spring surge of Columbines and Irises and Peonies and the autumnal cascade of Asters and Chrysanthemums. Nothing else can better cure midsummer drabness. For most gardens, both large and small, annuals in moderation are as usual as a baseball haircut on a western Senator.

Many annuals germinate promptly and, within 60 to 90 days, are in flower. Thus the impression, frequently though perhaps accidentally, has been conveyed that these obliging plants are all but self-raising and self-tending. Such is not precisely the fact.

Genuinely burdensome may be the task, under average home conditions, of raising a large number of annuals. Let us take the garden of Mr. and Mrs. Frank Elliott of Cedar Grove, N. J., as a case in point:

In many places the month of floral famine is August, but not with the Elliotts. For them, it is the year's high point. This commendable innovation is accomplished with Petunias. And what Petunias!

More than 600 3-foot plants, grown each year from seeds and cuttings by Mr. Elliott himself, develop immense fringed and double flowers of shapes and shades so exotic as to suggest orchids. Indeed, when displayed as a corsage, they've actually been mistaken for them.

Most Petunia species are tender perennials, natives of South America. Garden types are grown as annuals. The hybrids, with which Mr. Elliott has experimented, are tenderer than the usual garden sorts and would scarcely recognize, or be recognized by, their wild cousins. After trying out many strains, Mr. Elliott has come to depend for his main crop upon a tall sort known as the Triumphant Strain. They, like all double petunias, are highly artificial. The seed producing them results only from hand pollination. To make certain of having a sufficient number of plants for his own uses, this flower-minded stockbroker raises perhaps 1,000 seedlings. The excess is given away to fortunate friends and neighbors.

Mr. Elliott claims to lose very few seedlings. Since double petunias are admittedly not too easy during the early stages and since his experience is a reflection, in varying degree, of the tediousness to be encountered in handling annuals in quantity, his routine will be of special interest.

Operations begin about March 15. Dirt from his special Petunia bed is brought into the house. Incidentally, this bed is 6 feet wide and 125 feet long; and, to insure good drainage, is slightly raised above the level of the surrounding land. Flats are filled and patiently sown with tiny seed, one at a time, spaced perhaps an inch apart. (Most people simply mix small seed with dry sand or flour, scatter it over the surface of a flat or seeding pan, and press down with a flat board.) Mr. Elliott presses down his carefully placed seeds and then bottom-waters each flat in the kitchen sink. (The flat is simply set in water about half the depth of the flat; the water then seeps into the soil without disturbing the seeds.) Until germination, newspapers cover the flats. When seed leaves (cotyledons) appear, covering is removed and flats are placed in a sunny window. Subsequent waterings are always from the bottom, for this—and sunshine—Mr. Elliott considers of first importance.

Additional flats are filled with unsterilized garden loam, ordinary garden dirt. Into these, seedlings are pricked out as soon as they can be handled. With a short dowel Mr. Elliott makes holes, sets seedlings as deep as their leaves, and bottom-waters until the flat puddles. This process closes air pockets. Flats are returned to the southern window and seedlings are transplanted to 2-inch pots as the little plants become crowded or show signs of spindling growth. Feeble seedlings are never discarded. In the end, they generally produce the best double flowers. After hardening off, the young plants are set outdoors—as a rule, between May 15 and May 30. They're placed 18 inches apart and are invariably staked.

Particularly choice specimens are propagated by soft wood cuttings taken in late summer. Slips 3 inches or so long are firmed either in the Petunia border itself and shaded with inverted flowerpots, or are potted and removed to the shade of the cellar. They're kept damp; and strike in from 3 to 5 days. The pots containing the rooted cuttings are then sunk in the earth outdoors until cold weather, when they're transported to a near-by professional greenhouse for winter safekeeping.

Mr. Elliott's petunias are outstandingly good. They bring him a great deal of pleasure, which, of course, is splendid. Yet it must be evident that he has little time left to devote to plants of other types, just as it's equally clear that the growing of many annuals of any sort—especially when started in the house rather than outdoors around the first of May—is not quite so simple as rolling off a log.

Be that as it may, gardens need annuals to augment their perennials. How may they be acquired with the least strain on the garden maker's peace of mind?

The practical answer to the question, as a rule, is one of three. First, potted annuals may be purchased in early May from florists or nurserymen. Second, you may hire a professional to grow them from seed supplied by you. Third, you (or your gardener, if you have one) may raise them. At all three, however, valid criticism may be leveled.

The first method tends to produce gardens too similar to neighboring ones. Responsibility for this defect, however, can hardly be placed upon the plantsman. He must show a profit or go out of business. No commercial grower is to be censured for specializing in material he feels sure of selling. The second plan deprives the garden maker of firsthand knowledge, stresses dependence upon catalog descriptions and, by its vicarious nature, decreases gardening pleasure. The third, in the majority of cases, transforms diversion into a laborious chore. Scant enjoyment derives from biting off more than can be comfortably chewed.

What path, since these three lead to disappointment, shall one pursue?

Experience leads me to believe that a compromise between the second and third schemes retains the best features of each. Particularly when facilities are limited, a professional may very well supply the bulk of annuals needed for your permanent garden. You can specify varieties or, in February or March, furnish seed for him. By the usual arrangement, you contract to buy back at a definite price a certain number of potted seedlings or seedlings in flats. Thus, costs may be controlled; premeditated color combinations may be carried out; and the less hackneyed varieties may be secured. You will, of course, be reasonably sure of their performance in your garden; for, presumably, you will have tested on a small scale the varieties you order.

Testing composes your half of the bargain; and a most agreeable fraction it is, too. The same varieties act slightly differently in different gardens, even in different situations in the same garden. So many factors influence behavior: soils, exposures, seasonal conditions, the gardener's temperament. Each human's reaction to flowers is individual. Each garden maker, therefore, in order to assure himself that a variety or species will measure up to his expectations, should try it out—for at least one season and preferably more—under diverse conditions on his own land before he risks planting it on a large scale for landscape effect. In itself, the testing process is absorbing.

Seeding and trial operations, though productive of some cut flowers for the house, are not likely to be too pleasing to the eye. Shading devices and labels and odd plant bedfellows do not combine to create soothing scenes. Accordingly, it's wise to hide the test plot from the casual garden visitor; and, at the same time, to gain the step-saving advantage of concentrating activities within a small area. (See Chapter I on Trial and Propagation Area.)

The greatest satisfaction is derived as well as the greatest ease of maintenance realized, to my way of thinking, when annuals are supplementary to garden perennials. (See Chapter V.) However, therein lies no implication that borders or beds fashioned of annuals alone are worthless. Far from it. While they lack the variety and change and intellectual stimulus of a mixed border, they may be delightful.

Mr. Elliott's Double Petunia border, described earlier in this chapter, is unusual and charming. I shall never forget the startling quality of a bed 5 feet wide and 80 feet long which contained nothing but well-grown dahlia-flowered yellow and white Zinnias, backed by Grapes trained on a wire fence and edged with blue Ageratum. Nor shall I soon cease to remember the evening perfume of White Petunias, cascading from terrace boxes, filling the quiet air for hundreds of feet about them with ineffable sweetness. No garden of mine has ever gone without White Petunias or

Flowering Tobacco, for both of them, in marked degree, join enchanted fragrance to the witchery of twilight.

Perhaps politicians and railroad men are chiefly to blame for the average experienced garden maker's slightly snooty attitude toward annuals. Certainly one may find without searching farther than—let us say, Mt. Royal Station or North Broadway in Baltimore (yes, Baltimore; despite the fame of Guilford, Homewood, and Druid Hill Park), weird examples of municipal and depot floral art.

Yet annuals, bedded in modern style, may be tremendously effective. Observe how the lowly Portulaca at Jones's Beach, Long Island, in beds 4 to 5 feet wide and hundreds long, contrasts its strong, hard colors with great stretches of the smoothest and greenest of turf. See how handsomely the value of massed plantings of single varieties is demonstrated in all the formalized gardens on the roofs of Rockefeller Center in New York City. Take heed how at the New York World's Fair tens of thousands of geraniums, pansies, lantanas, ageratums, heliotropes, verbenas, massed in lusty, poster-like strokes, formed with the buildings a virile but harmonious polychrome. Such large-scale smashes may be translated by the perceptive amateur into small-scale editions; and at no great cost, for bedding annuals may be bought from florists and nurserymen for $7.00 to $10.00 a hundred for potted seedlings, or even less for seedlings in flats.

Essentially, the differences between older methods and present-day bedding are these: the older patterns were small in scale, pale and indeterminate in hue, awkward in location so that lawn areas were chopped into bright little chips of unrelated tints; modern patterns are large in scale, brave and dramatic in color, in location complementary to grass panels or massed (and usually clipped) shrubbery or evergreens. As an adjunct to homes of definitely modern architecture, there's much to recommend modern bedding. If you're the kind of gardener who from a safe, clean chair on the porch directs a nursery crew, bedding annuals may be your dish. But if you're the sort who likes the feel of good, brown loam between his fingers, who responds to the kinship between his growing plants and his own spirit, then I rather suspect that, for the most part, annuals will tumble from your terrace boxes and drift through your hardy borders, as they have through mine.

Comparatively few annuals or flowers grown as annuals, if the truth be told, are well adapted to mixed border use. The long stems which make China Aster (*Callistephus chinensis*) so valuable for cutting, for instance, render it unsuitable for border drifts or massing. In fifteen years of experimenting, the following have earned my confidence by past performance under my own hand. Since a few of them are often overlooked, it may be helpful to list them (for added convenience) by approximate color:

Blue: *Salvia patens; Torenia Fournieri* (particularly for shady or half-shady situations); Petunia, Blue Wonder; Lobelia, Cambridge Blue (needs heavy, rich soil); Ageratum, Blue Perfection.

White: Petunia, Snowstorm (very easy from seed, self-sows, many seedlings still a good clear white to third generation); *Nicotiana sylvestris;* Zinnia, Polar Bear; Sweet Alyssum (*Alyssum maritimum* and its named varieties); Cape Marigold (*Dimorphotheca pluvialis ringens*).

Yellow: Marigold, Yellow Supreme (tall, lemon-yellow); Marigold, Yellow Flute (low–12 to 15 inches–lemon-yellow; new and excellent); dwarf Lantana (yellow and red-orange); Fantasy Zinnia, Star Dust (foliage of Fantasy type better than most Zinnias).

Red: Zinnia, Crimson Monarch; Nicotiana, Crimson Bedder; Rust-resistant Snapdragon (*Antirrhinum*), Campfire; Cosmos, Giant Crimson; *Salvia splendens.*

Orange or Bronze: Rust-resistant Snapdragon, Copper Shades (wide variations in color but all harmonious); Marigold, Harmony; Marigold, Burpee's Red-and-Gold Hybrids (occasional red flowers, but mostly a luminous red-orange, new and very good); Cosmos, Burpee's Golden; Nasturtium, Golden Gleam (needs fairly rich soil, spent mushroom compost ideal); Zinnia, Oriole.

Pink: Rust-resistant Snapdragon, Loveliness; Early Double Crested Cosmos, Pink; Petunia, Martha Washington (soft mauve, better than average in coming true to type from seed); Zinnia, Exquisite.

Summary of Chapter VII: *Annuals are cheap,* *quick, one-season plants needed in most gardens to make up a dearth of midsummer perennial bloom.*

To grow a great many, especially starting them under glass or in the house, is burdensome for the amateur garden maker. Practical means of acquiring them in quantity include: 1. Purchase of potted annuals from nurseries; 2. Hiring professional to grow from seed furnished by you; 3. Grow them yourself. Best plan is to hire professional to raise varieties previously tested out by garden maker in Trial and Propagation plot.

Borders and beds of annuals alone, while not so stimulating as mixed borders, may be delightful. Principal differences between old-fashioned bedding and up-to-date bedding are: Old patterns were small in scale, weak in hue, awkward in location; present-day patterns are large in scale, dramatic in color, in location complementary to grass panels or massed shrubbery or evergreens.

For mixed borders comparatively few annuals are really good. A list of adaptable sorts, arranged by approximate color, is furnished.

CHAPTER VIII

DAFFODILS AND OTHER BULBS

The Practically Perfect Flower; How Narcissus Is Classified and How a Representative Collection May Be Started; Tulips, Hyacinths, Crocuses and Minor Bulbs; Lilies, Queens of Late Summer; How to Naturalize Bulbs; Opportunities for Bulbs in the Mixed Border; Summary.

Narcissus is more than a welcome early flower. It is of the essence of spring, as significantly inspiriting as the First Robin, the First Crocus, the First Violet. Yet, apart from aesthetic qualifications, it is the most practical of plants.

Field mice do not bother it, as they do Tulips and Lilies. Few diseases or insects attack it. Many types of soil support it. In one place, it can remain happily for years. It adjusts itself to the half-shade of deciduous trees or shrubs, or to baking in a sunny border. So flexible and accommodating is the Narcissus, in fact, that it's well-nigh impossible for any place to have too many representatives of the genus. Of all bulbs contributing to gardens, it is the most agreeable.

Let's clear up, at the start, the confusion which appears to exist as to names and classifications. In the mind of the average amateur the terms Daffodil, Jonquil and Narcissus seem particularly tangled; nor, as a matter of fact, is this condition to be wondered at. Narcissus is among the oldest of cultivated plants. Not only are its varieties legion but systems of grouping by types from time to time have been changed. Names, in reality, are not overly complicated. If you say Narcissus, you can't go wrong. The generic name is *Narcissus*; and therefore all Daffodils and Jonquils are *Narcissi*. Modern Trumpet Daffodils are descended mainly from *Narcissus Pseudo-Narcissus;* the Jonquil, perfumed and ornamental, is *Narcissus Jonquilla.* The words Daffodil and Narcissus, in ordinary speech, are virtually interchangeable. If you want to be fussy about it, you can say a Daffodil is a large-crowned *Narcissus;* a Narcissus is a small-crowned *Narcissus;* a Jonquil is a type of *Narcissus* with narrow, rushlike leaves. Whatever you call it isn't going to discourage the bulb. It will still scatter its fragrance upon the chilly vernal air. Sir Watkin "by any other name would smell as sweet."

The classification system now in universal use, first adopted by the Royal Horticultural Society of England, places garden forms of Narcissus into eleven main groups and includes several subdivisions. Like older classifications, it's based in the main upon relations between the outer flower petals (perianth) and the central tube (corona) which, depending upon size and shape, is also known as trumpet, crown, cup or eye.

Fanciers and bulb dealers, naturally, find these classifications expedient. But the owner of a small garden will be helped by them too; especially if he, or she, is anxious to obtain a fairly representative collection.

These are the main groups:

I. Trumpet Daffodils
II. Incomparabilis
III. Barrii
IV. Leedsii
V. Triandrus Hybrids
VI. Cyclamineus Hybrids
VII. Jonquilla Hybrids
VIII. Tazetta and Tazetta Hybrids
IX. Poeticus Varieties
X. Double Varieties
XI. Various (mostly dwarf species).

Now, when you start to go through a grower's catalog you may, provided you're not a dyed-in-the-wool fan, be a trifle stunned by the large number of named varieties. Don't let that floor you, however, for the chances are the varieties will be listed in accordance with the above classifications. You can make a good start by choosing a few from each group; nor will this prove a very costly undertaking, either, for many splendid varieties are only $5.00 or $6.00 a hundred. Low cost usually means not only that the variety is old and plentiful, but that it's reliable.

Suppose we thumb through a hypothetical catalog and pick out a few varieties—some inexpensive, some new and far from cheap—but all good:

In Trumpet Daffodils—the trumpet or crown as long or longer than the perianth segments: Golden Spur (yellow trumpet), old but usually the first outdoor daffodil to bloom; Aerolite (yellow trumpet), very large but well-proportioned, good cut flower; Beersheba (white trumpet), one of the best of the newer varieties, about 20 inches high; Madame de Graaf (white trumpet), the first of the White Trumpets and still a good landscape variety, relatively cheap; Mrs. E. H. Krelage (white trumpet), a show flower, nicknamed the "white King Alfred"; Lovenest (white trumpet), perhaps the best "pink" daffodil, though Mrs. R. O. Backhouse is better known.

In Incomparabilis—cup or crown not less than one-third but less than equal to the length of the perianth segments: Sir Watkin, old and cheap in price but sturdy, graceful and of wonderful fragrance; Bernardino, large flower, conspicuous cup yellow edged in orange; Dick Wellband, striking flower with brilliant red-orange cup, now becoming moderately priced; John Evelyn, very large but very graceful, fluted lemon-yellow cup, in my opinion the most beautiful daffodil in cultivation today. Almost all the newer varieties in this class are worth attention: Yellow Poppy, Walter Hampden, Red Cross, Francisca Drake, Fortune and many others.

In Barrii—cup or crown less than one-third the length of the perianth segments: Conspicuus, an old variety but a fine flower just the same, excellent for naturalizing; Fleur, broad perianth segments, frilled cup of yellow edged red-orange; Bath's Flame, yellow perianth, yellow cup edged red-orange, startling; Mrs. Barclay, overlapping perianth segments, frilled yellow cup edged orange, showy but refined.

In Leedsii—perianth white with cup or crown white, cream or pale citron, sometimes tinged with pink or apricot; embracing different dimensions: Hera, well known and very lovely; Queen of the North, fluted cup, substantial, a good naturalizer; Nette O'Melveny, lemon-yellow cup with apricot picotee, good foliage; Gertie Millar, a Giant Leedsii, overlapping perianth segments, cup fluted, very attractive.

In Jonquilla Hybrids—two or more small flowers *on one stem, marked fragrance:* Double Campernelle, strong stems, keeps well as cut flower; Orange Queen, bright orange flowers borne level with the foliage, decorative and amusing; Jonquilla Simplex, quaint little citizen about the size of the Snowdrop.

In Tazetta and Tazetta Hybrids the important garden group is the subdivision Poetaz, hybrids resulting from crossing Poeticus and Tazetta sorts: Poetaz are cluster-flowered. They produce a sprightly mass effect and, unlike Tazettas, are hardy. One of the best is Orange Cup, well described by its name, holds color well even in full sun; Elvira, white petals, golden-yellow cup edged orange, blends well with other plants; Scarlet Gem, primrose-yellow perianth, deep orange cup, a brilliant combination.

In Poeticus Varieties—the late-blooming Poet's Narcissus, white petals, small bright cup or eye: Ornatus Maximus, improved Pheasant's Eye unexcelled for naturalizing; Rupert Brooke, nicely proportioned relatively new variety now becoming fairly low-priced; Horace, very large but full of grace, eye yellow edged red.

In Double Narcissus (if you like them): Mary

Copeland, The Pearl and Twink are among the best.

In Groups V, VI, XI we find very interesting dwarf sorts: Suited to rock gardens, planting among flagstones, along the brookside, on the border's edge. Let's pick just one of each of these classifications: *Cyclamineus Hybrid* February Gold, very early as the name implies; *Triandrus Hybrid* Agnes Harvey, dainty, dwarf, drooping white, several flowers to a stem, naturalizes well; *Class XI, Various,* the Yellow Hoop-Petticoat (*Narcissus Bulbocodium* var. *conspicua*), amusing little open-throated flower about 6 inches high.

This list of three dozen hardly scratches the surface. At the same time, it does cover a good many more types than most gardens boast and would constitute a fair cross-section, a reasonably solid foundation on which to build. Suppose one's initial purchase were only a dozen each, 432 bulbs. Suppose they were taken up to be sorted and replanted the second year. The chances are more than 1,600 bulbs—a four-fold increase—would be discovered. From an investment standpoint that doesn't seem half bad, does it?

The culture of Narcissus is simplicity itself.

Most types do best in a fairly heavy but well-drained soil. In light shade the color of the flowers is improved. Fresh manure is to be avoided, but old manure or dried dungs may be worked deeply into the soil preferably six months ahead of planting; or an established plantation may be dressed in winter with well-rotted manure or dried manure, a necessary enrichment when bulbs are to remain in the ground and are to be planted over with annuals. Foliage must be allowed to ripen thoroughly. (This is true of all bulbs, just as is the danger of fresh manure and the necessity for good drainage.) If flowering becomes shy, dig the bulbs after leaves have browned, sort them and replant them in flat-bottomed holes (to avoid air pockets) at a depth twice the diameter of the bulb. In most narcissi, this would mean 5 to 6 inches deep. To encourage a more rapid increase, the bulbs may be dug biennially or even annually.

In our enthusiasm for Narcissus, though the genus deserves all we can summon, we mustn't overlook Tulips and Hyacinths and Crocuses and Scillas and certainly not the Lilies, for they are among the grandest of garden flowers.

Tulips, Hyacinths and Crocuses are often called "Holland Bulbs" because so many of them are grown there. They are imported to this country in enormous quantities, are also grown here—mostly in the Pacific Northwest—and are customarily ready for delivery to gardeners in October. Narcissus is shipped as a rule in September. It should be planted right away; indeed, you can move narcissi in your own garden as soon as foliage is ripe—usually from July to September. Hyacinths and Crocuses, in fact most bulbs, ought to be planted soon after they're received; but it is sometimes worth while to delay Tulip planting until November.

The reason for postponement is field mice. They eat tulips. Moles tunnel among the bulbs in search primarily of earthworms and grubs. But field mice, following along in the moles' abandoned runways, aren't so particular. Their appetites are more vegetarian. They'd just as soon nibble a tulip bulb as not—sooner, in fact. And so we clear this hazard in one of three ways: plant in baskets made of hardware cloth; use Rodopel when planting (peat moss impregnated with a rodent repellent); or put off planting until both moles and mice have become somewhat less active. Delay winter covering until the ground is frozen hard or, in very well-drained soil, forego winter mulching altogether, as added precaution.

Hyacinths come in good colors—white, blue, pink, red, yellow—but are more valued for their fragrance than for any other quality. Crocuses are cheap and early and gay. So long as foliage is permitted to ripen, they can be planted anywhere. They're much more effective when massed by single color groups of 100 or more bulbs (corms) than they are scattered about like confetti. In general the blues and yellows make the best garden pictures.

The great thing about Tulips is their color. Foliage doesn't amount to much and stems are stiff and military. But the color range is nothing short of miraculous. The thing to do, of course, is to get on the mailing list of some good dealer (Wayside Gardens, Mentor, Ohio, for instance), study his lists, and make selections according to your own lights. However, it might be helpful to point to a few tried and true varieties which aren't too expensive and are reliable:

Orange effect: Dido, Afterglow.
Pink: Picotee, Clara Butt.
Purple: Blue Eagle, Humming Bird.
Lavender: Reverend H. Ewbank, Heliotrope.
White: Mrs. Grullemans, White City.
Yellow: Moonlight, Mrs. Moon.
Red: Gloria Swanson, City of Haarlem.

Species Tulips or Botanical Tulips, as they are called, are tough little customers and very intriguing. One or two are well known, such as the Candy-Stick Tulip (*Tulipa Clusiana*) and the Water-Lily Tulip (*T. Kaufmanniana*), but many others are rather passed over as garden possibilities. They range in height from the 6-inch *Tulipa biflora,* a neat little yellowish white, to *Tulipa acuminata,* 16 to 18 inches tall and variable, usually yellow lined with red-orange. What the Tulip species like is to be planted 6 to 8 inches deep in a sandy, hot spot and left alone. No watering. No cultivation. Most of them are low in price.

Various other minor bulbs are rather more widely planted and, in truth, are better adapted to ordinary garden opportunities. Some of the Crocus species—such as *Crocus Korolkowii,* a coppery yellow-orange, and *C. Sieberi,* golden-throated lavender-blue, and *C. Imperati,* buff striped with lilac—are charming little things. They bloom very early, often in February. Autumn-flowering Crocus species are well worth while, particularly the rosy-lilac *Crocus zonatus* with its conspicuous orange anthers. And so is the rosy-purple, rather similar but unrelated, Meadow Saffron (*Colchicum*) which generally blooms in August and September a little ahead of the fall Crocuses.

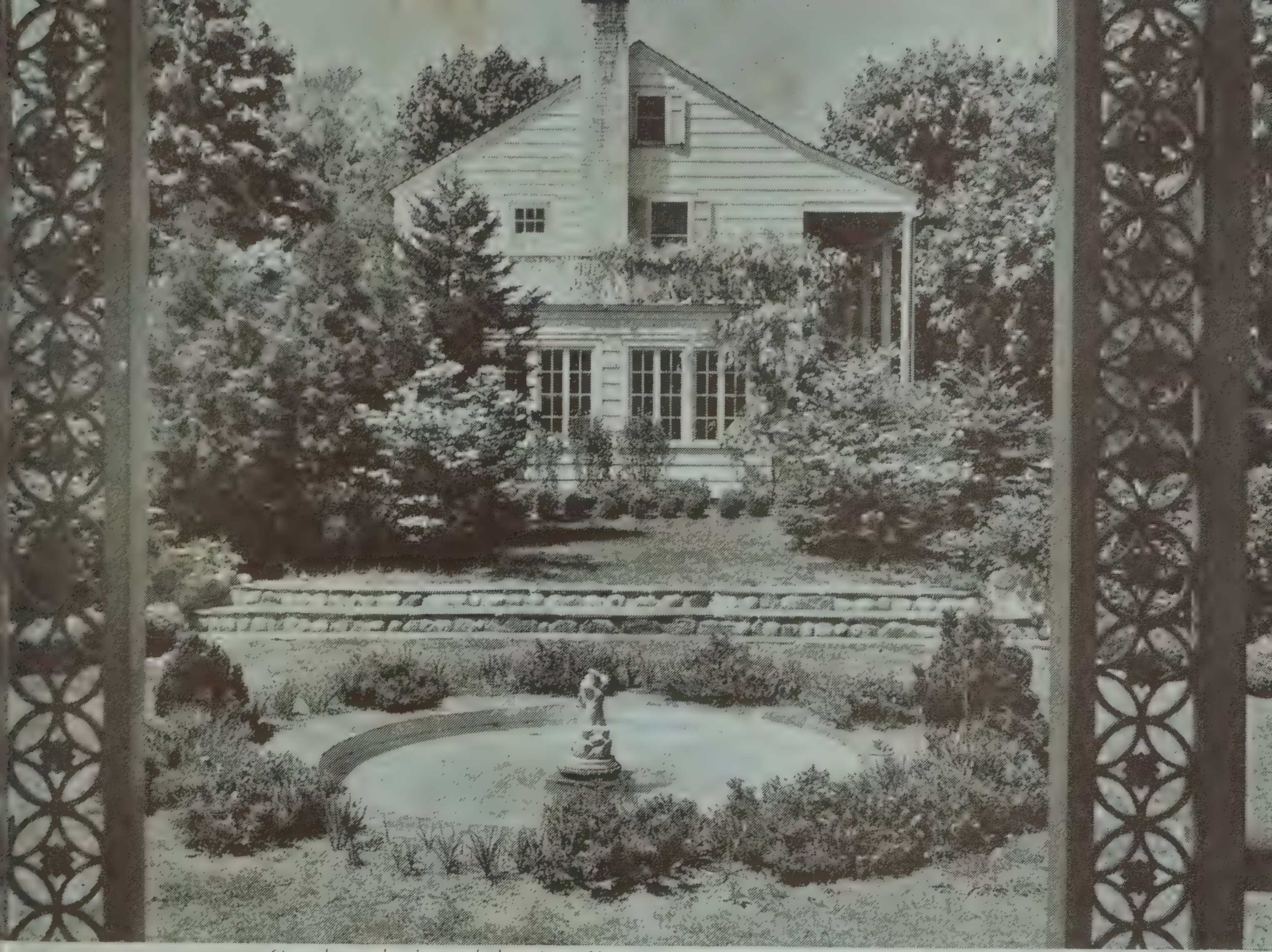
Then there are various delightful bulbs and bulbous plants, either entirely hardy or hardy with winter protection, which are more or less forced by the blatant prominence of the Dutch bulbs to occupy a seat below the salt. If you wish your early garden to be distinctive, may I suggest closer study of those back pages of bulb catalogs, usually headed "Miscellaneous Bulbs"? Fewer Tulips and fewer Crocuses along with more Camassias and Chionodoxas and Trout Lilies (*Erythronium*) and the sweet-scented *Iris reticulata* and Wood Hyacinths (*Scilla hispanica*) and Mission Bells (*Fritillaria recurva*) and Guinea-hen Flowers (*Fritillaria meleagris*) and Stars of Bethlehem

(*Ornithogalum umbellatum*) and Summer Snowflakes (*Leucojum aestivum*) and Siberian Squills (*Scilla sibirica*) and Grape Hyacinths (*Muscari*) often with reduced effort and expenditure would improve many a small garden.

Summer flowering bulbs and other bulbous plants grown outdoors and taken up during winter, such as the Gladiolus and the Dahlia, leave me cold. I might as well be frank about it. You can, if you wish, discount my prejudice and keep right on growing them. If they make you happy, far be it from me to interfere. But with few exceptions—the small Coltness dahlias grown from seed and Begonias and Cape Hyacinths or Ismenes (*Hymenocallis calathina,* a member of the Amaryllis family) and Tuberoses (*Polianthes tuberosa*) and Agapanthuses—to me it seems unsound, when space and facilities are limited, to give border room to plants which must be stored, when there are available so many excellent ones which can remain where they're planted.

However, Gladioli and Dahlias are very popular summer and fall flowers (particularly with men) and a word on their culture would seem to be indicated. Both prefer a sunny situation and a well-drained, loamy soil. In advance of planting dahlias, dung—or other humidifying agent—should be worked deeply into the earth; but manure, especially fresh manure, risks the health of gladioli, as it does indeed of all bulbs.

Modern types of Gladioli derive chiefly from South African species of these corm-bearing herbs. (A corm, loosely defined, is a solid bulb.) Valuable for cutting, gladioli aren't any too useful in the border since they flower but once. For a succession of bloom, groups of corms may be planted 2 to 4 inches apart and 4 to 5 inches deep at intervals of about 15 days from the time soil can be worked in spring until July 1. Planting at such depths avoids the necessity for staking. When the flower is produced, the old corm begins to die and a new one develops on top of it; at the same time along the base of the new bulb offsets (cormels) are formed. By planting the cormels 1 to 2 inches deep to grow into blooming-size plants in from one to two years, a variety may be multiplied. When the tops have ripened, the plants may be dug, the stems clipped off a few inches above the bulbs and the corms dried and stored in a



Garden designed by Sterling Patterson. Photograph by Samuel H. Gottscho

Mrs. Harriet Doremus's little formal sunken garden on the North Shore of Long Island contains an unusual teahouse and features a pool ringed with *Daphne Cneorum*, bulbs and low annuals. The garden proper is only 50'x50' and is augmented by a cutting and propagating section of equal size.

Photograph by Blakesl

Despite the temptation of available acreage Mrs. Randall Compton has not allowed the garden on her remodeled farm at Sparks, Md., to grow too large for personal management. The house was built in 1811 but all the planting is relatively new.

frostproof, airy place. Some time during the winter, remains of old corm and foliage should be rubbed off and the new clean corms made ready for spring and summer planting.

Today's spectacular Dahlias, springing primarily from a few Mexican species of the tuberous-rooted perennial herbs, are propagated by seeds, cuttings, grafting and root divisions. To amateurs the last-named is the most important. Divisions should be made with care, for the growing points (eyes) aren't on the tubers but are on the crown to which the tubers are attached; and at least one eye is essential to growth. The roots are planted 6 to 8 inches deep and 2 to 3 feet apart, with the tuber lying on its side. For best results cultivation takes the place of artificial watering (except during severe drouth when soaking, followed by surface cultivation to conserve moisture, is beneficial); hence the need for thorough soil preparation. While strong roots may be set out about two weeks before danger of frost is over, most people don't plant dahlias until settled weather—about May 10 in the latitude of New York. Staking of some sort usually is required; for flowers of most types are heavy and may split the stems, especially when side buds are removed to throw the plant's strength into the terminal bud. Roots are lifted as soon as frost has killed the tops. The blackened stems are cut off 8 to 10 inches above the crown, dirt is removed, the roots dried in the open air a few hours, then stored in a cool but frost-proof place, such as a part of the cellar away from the heating plant. Since most cellars are overly dry, the safest way to store dahlia roots to prevent shriveling is to cover them completely with dry sand or dry peat moss.

Lilies—I mean the bulbs, the genus *Lilium,* not *Hemerocallis* or *Hosta* or *Nymphaea* with all of which people do sometimes confuse them—are something else again. There's just one word for them: magnificent! Whatever trouble it takes to have them, they rate.

As a matter of fact, Lilies are nothing like so hard to grow as many gardeners suppose them to be. It's true the genus is widely scattered geographically; that different lilies are found under varying conditions of soil, climate and situation; and that some species are as tricky as a fringed gentian. Yet there are, at the same time, several dozen of the 100 or more species which can be counted upon to furnish for practically any garden robust, long-lived, spectacular groups.

For most of them, sandy rich loam to which peat moss has been added is preferable. Good drainage is very important; and fresh manure should be scrupulously avoided. The common practice of surrounding the scaly bulb with sand or fine gravel is a sensible precaution, which not only assists drainage but tends to discourage worms. Worms occasionally eat the bulbs; and so do mice. Sometimes it becomes necessary to trap or poison the mice, or to plant the bulbs in baskets of hardware cloth.

In general, bulbs are planted at such a depth as to bring the top of the bulb to a point three times as deep as its diameter, in the majority of cases 9 to 12 inches. Distance apart usually is 6 inches for small sorts, such as *Lilium tenuifolium* or *L. elegans,* and 12 inches or more for larger species, like the Golden-banded Lily (*Lilium auratum*) or Tiger Lily (*L. tigrinum*). Parenthetically, the Tiger Lily is not the Tawny Day-lily (*Hemerocallis fulva*), neighborhood small boys to the contrary notwithstanding. Both plants are very persistent, both have escaped from old gardens and have become naturalized in some eastern sections.

Since Lily bulbs are harvested in odd corners of the globe, most shipments are received quite late—November or December, perhaps. Often, it's necessary to keep the soil workable by mulching it heavily. When the bulbs have to be set out in late fall or winter, it is safer to mulch them; in fact, winter covering is a recommended practice for all lilies. In your own garden, the best time to change the position of bulbs or to take them up for some other reason is from two to four weeks after the flowers fade or seed is ripe. Give them a good background of shrubs or evergreens, a situation lightly shaded at least part of the day and protected from high winds which may snap their stems. You can stake them, of course, but lilies look much better without staking. And in cutting the blossoms, remember your lilies are bulbs and need ripened foliage for health. Do not, therefore, cut the stem more than halfway. If you cut to the ground, you'll probably destroy the bulb.

Lily roots are formed permanently at the base of the bulb (bulb or basal roots) and, in most species, also annually on the underground stem

(stem roots) above the bulb. When bulbs are shipped from a distance, the bulb roots usually wither away. They should be present and that is one reason why it's better to acquire bulbs from growers near at hand, when that is possible. Some species, however, are non-stem-rooting. These are planted shallow (on an average 6 inches deep) and include *Lilium candidum, L. Martagon, L. superbum, L. tenuifolium, L. testaceum, L. washingtonianum* and a few others infrequently attempted in gardens.

Although few insects trouble them, Lilies are subject to two serious diseases: a species of Botrytis; and a virus disease, a Mosaic. While it's said Botrytis blight can be controlled by removal and destruction of affected parts followed by spraying of the plant and neighboring ones with Bordeaux Mixture, the soundest garden practice, I believe, is to snatch out and burn any lily showing any sign of any ailment. Once a plantation is healthily established, it's likely to remain so and to improve from year to year.

Now, for its suggestive value, let's make a list of a dozen especially beautiful Lilies. Let's cover the flowering range—June, July, August, September—and at the same time limit choice to those best calculated to thrive under average conditions:

Madonna Lily (*L. candidum*): 2′ to 4′, June-July, pure white. Full sun.

Regal Lily (*L. regale*): 3′ to 6′, July-August, inside of flower white shaded canary-yellow, outside white tinged yellow with purplish midribs. One of the best.

Nankeen Lily (*L. testaceum*): 3′ to 6′, June-July, apricot. One of the most beautiful and graceful of all. A remarkable color.

Coral Lily (*L. tenuifolium*): 1′ to 2′, June, brilliant scarlet. Easily grown but short-lived. A fascinating dwarf.

Golden-banded Lily, variety sometimes called Macranthum (*L. auratum* var. *platyphyllum*): 8′ to 10′, July-August, very large, very fragrant, white slightly spotted crimson, yellow midrib extends full length of each segment. Larger and stronger than the type. Generally short-lived but gorgeous.

Showy Lily, variety sometimes called Improved Rubrum (*L. speciosum* var. *magnificum*): 2′ to 4′, August-September, reflexed flowers deep pink spotted red, edged white. Larger and stronger than the type.

Tiger Lily (*L. tigrinum*): 2′ to 4′, August-September, reflexed salmon-red spotted black. Variety *splendens* often 6′; larger and stronger than the type.

Henry's Lily (*L. Henryi*): 4′ to 8′, August-September, yellow-orange spotted reddish-brown. Unlike most, is not fragrant. Long-lived and easily grown, tolerant of soil and situation.

Hanson's Lily (*L. Hansonii*): 3′ to 5′, June-July, golden-yellow spotted purplish-brown. Robust and likely to be permanent.

Turban Lily (*L. Martagon*): 3′ to 6′, June-July, reflexed claret-purple spotted purplish-black, red-orange anthers. Color and form desirable, but odor is offensive to some noses.

Irish Orangeman Lily (*L. croceum*): 3′ to 6′, June-July, yellow-orange spotted purplish-black sometimes tinged red. Native of the Alps. Very vigorous.

American Turk's-Cap Lily (*L. superbum*): 3′ to 8′, July-August, red-orange shaded yellow spotted purplish-brown at base. Variable. Perhaps the showiest American species.

To naturalize bulbs is to create an effortless spring picture. Small gardens, since they're usually cared for by their owners, should be especially alert to such providential chances. It's really surprising how many spots there are, even on a spic and span little place, where bulbs can be casually rolled out, planted where they fall, and the grass left untrimmed long enough for bulb foliage to brown and ripen; and equally astonishing what an extraordinarily large number of bulbs can be tucked into such areas without presenting a crowded or fussy appearance.

Here's a case in point: The end of a border in one little garden I know is marked by an amiable old apple tree which stretches comforting arms over a picket fence on one side and across a corner of lawn on another. Here—in the border itself, beside the picket fence, and drifting beyond the tree's shadow—repose several thousand bulbs. Close to the fence, 100 or more Crocuses blow airy blue bubbles in the grass; in the border at the base of the tree, a colony of Trout Lilies or common Adder's-tongues (*Erythronium americanum*) mingles contentedly with Wood Hyacinths, pale Leedsii Narcissi, and Snowdrops (*Galanthus nivalis*) interplanted with Fringed Bleeding Hearts, cluster-flowered Primroses, *Phlox divaricata* and Violets; through the adjacent lawn, troop hundreds of Muscari and more than 600 small-cupped and Poeticus varieties of Narcissus. Except for the border bit, this particular plantation was virtually undisturbed for more than ten years. During that time, the bulbs no doubt multiplied tremendously.

Yet, since they flowered well and the unmowed lawn in that situation was not unattractive, there seemed to be no good reason for moving them. For ten years, therefore, each spring was welcomed by delicate blossom and "rich-distilled perfumes" while demanding from the gardener scarcely more than an occasional kind word.

In every small garden exist opportunities for naturalizing not a handful of bulbs, but hundreds. Seek them out. Whenever you think of tree and shrub groups, think of underplanting. Whenever you think of underplanting Pachysandra or Vinca or Ajuga or Ivy, think of interplanting Lilies and Narcissi and Indian Quamashes (*Camassia*) and Wood Hyacinths. Ground covers and bulbs are Damon and Pythias. They should be as closely associated in the gardener's mind as borders and backgrounds.

In the mixed border may be housed bulbs galore. A bulb garden, in effect, is planted on top of an herbaceous one. Long thin lines of bulbs—not straight rows, of course, but only a little distance away from perennial roots—interfere but slightly, if at all, with border cultivation. And they add immeasurably first to the spring picture and later, when stately Lilies hold sway, to the midsummer one.

Blue Siberian Squills and fat yellow Crocuses and jolly little Jonquils may perch at the border's edge, their ripening hidden by the maturing of, let us say, *Campanula carpatica.* Behind the lacy foliage of columbines or thrusting their spears between the large reniform leaves of *Anchusa myosotidiflora,* shapely Cottage Tulips or formal varieties of Narcissus, such as are found in the White Trumpets, the Incomparabilis and Poetaz sections, are eminently at ease. Farther back, their unbending arrogance mitigated by greening phlox and tender peony shoots, pools of tall Darwin and Breeder Tulips swirl and shift in the May sunlight like waves upon an iridescent sea. And last of all, near the asters and delphiniums, though now and then stepping forward to challenge attention by their queenly bearing, those royal visitors to the late summer garden: the Lilies.

The danger in using bulbs is not that the gardener will plant too many, but that he'll set out too few. A couple of dozen mixed Tulips, scattered like unstrung bargain-counter beads upon the landscape, are as restless as an Easter Egg hunt. But 50 Cherry Pink, 50 Starlight, 50 Scotch Lassie Tulips, massed by color and blended cautiously by intervening greenery of background and perennials; a dozen Regal Lilies; 100 Sir Watkin sauntering through the middle ground or 150 Orange Cup Narcissi nodding above the foreground herbs; 300 Queen of the Blues Crocuses—by such scale in planting, even in small gardens, are sound and soothing bulb pictures created.

Bulbs ask so little. They give so much. In humble gratitude, the least we gardeners can do is to plant them with lavish hands.

Summary of Chapter VIII: *Of all bulbs contributing to gardens, the most agreeable and easily raised is the Narcissus. All Daffodils, Narcissi and Jonquils belong to the genus Narcissus. There are 11 main classifications, and the start of a grand collection may be made by choosing a few varieties from each group.*

While Tulips, Hyacinths and Crocuses are pleasant enough, one should not overlook fall-

blooming Crocus species, Colchicums, Botanical Tulips, Camassias, Trout Lilies, Wood Hyacinths, Mission Bells, Guinea-hen Flowers, Grape Hyacinths and other charming minor bulbs, by the use of which small gardens frequently may be improved.

Lilies are truly magnificent. Their culture is not so simple as that of some other bulbs, but they are less difficult than gardeners generally suppose them to be. In the list of a dozen exquisite ones to which special attention is invited, there are almost certain to be species which will form in your garden robust, long-lived, spectacular groups.

To naturalize bulbs is to plant them and leave them alone to create for you effortless pictures. In all gardens exist opportunities for naturalizing. Mixed borders may house bulbs galore. The danger in using bulbs lies not in setting out too many but too few. They should be planted in small gardens on a large scale, for they ask so little and give so much.

CHAPTER IX

EVERGREENS ON THE SMALL PLACE

What We Mean by Evergreens; How and When to Move Them; How and When to Prune; Typical Problems They May Help to Solve; Certain Species and Varieties of Evergreen Shrubs Especially Useful in the Small Garden; Summary.

Evergreens are defined as plants that retain green foliage the year around. When we think of them, we don't as a rule bring to mind a perennial like *Alyssum saxatile*, which actually is evergreen, but we consider instead two main classes—coniferous (cone-bearing) trees, and evergreen shrubs. Not all conifers are evergreens, any more than all evergreen trees are conifers. The Larch, which with its high green foliage lights up our spring gardens, is a conifer but it sheds its leaves each winter; the great Southern Magnolia (*Magnolia grandiflora*) is evergreen but not a conifer. Nevertheless, for ordinary purposes it's feasible to divide evergreens into two major classifications: *Coniferous Evergreens,* such as Pines and Hemlocks and Yews; and *Broad-Leaved Evergreens,* such as Rhododendrons and Laurels and Mahonias.

In previous chapters, we've already discussed various garden usages of conifers: for hedges; for landscape and border accents; for base planting; for terraces or gardens to the north of a house. We've indicated that conifers in general are fairly adaptable to different soils (or, as they grow, modify the soil chemically to suit themselves); but that several of the handsomest broad-leaved evergreens are definitely particular as to soil. We've explained the meaning of soil acidity and we've told in Chapter III how to construct an acid bed to suit these intolerant beauties.

In this chapter let's talk chiefly about acid-soil and shade-tolerant plants. First, however, let's try to clear up misunderstanding of two phases of evergreen culture which often trouble amateurs: how and when to move evergreens; how and when to prune them.

To move most evergreens less than 6 feet tall is very simple, provided they're nursery grown. In the wild, roots travel far in search of sustenance. But nursery specimens are grown for landscape purposes and therefore are frequently transplanted and root-pruned to induce development of a large and unnatural ball of fibrous roots. These more or less artificial roots help the plant quickly to establish itself when it is moved—usually balled and burlapped (B&B)—from the grower's field into your garden.

Make the hole large enough; dump in a layer of good topsoil; set the evergreen in place an inch deeper than it stood in the nursery row; loosen but do not remove the burlap for it will rot out rapidly and will disturb roots less to leave it on; fill the hole with topsoil, tamping as you go; *soak* with water; mulch to prevent drying out, and that's all there is to it. Evergreens taller than 6 feet may, because of the weight of the earth ball, need special equipment and trained men for successful handling. Conifers in the larger sizes need to be guy-wired to prevent winds from snapping developing new roots.

To change the position of small evergreens in your own garden is anything but difficult and, if they've not been in one spot too long since leaving the nursery, amateur transplanting will probably be perfectly satisfactory. Unless the little tree or shrub is less than 2 feet high, two people on the job are better than one. Armed with a spade, each digs straight down a foot or more from the trunk until a circle has been completed. Then, taking positions opposite each other, the workers thrust downward and inward. If both spades get down deep and pry upward at the same time until they gradually encircle the specimen, the evergreen—roots intact and protected by an earth ball—finally will be lifted out very much as a potted plant is knocked out of a pot. Slide a piece of burlap under the earth ball to make a sling for carrying the evergreen to the new hole which should have been dug for it in advance of the move. The object is to disturb and expose the roots as little as possible while transporting the specimen from one spot in order to plant it in another.

Since transplanting of young specimens is neither complicated nor likely to result in failures, it's perfectly possible on many places to operate a small-scale evergreen nursery and thus, by patience and a little care, to save a good many dollars. Tiny evergreens, which have been transplanted once or twice, can be secured at low cost from professional growers. In average soil, these usually live without difficulty; though ericaceous plants, like Rhododendrons and Laurels, need some shade and soil free of lime. Japanese Yews are perhaps the easiest to manage in amateur nurseries; but Firs (*Abies*) and Spruces (*Picea*) are not far behind. To maintain a fibrous root ball, the youngsters will have to be transplanted every two years until placed in final position.

Nurserymen move conifers at almost any time of year. Caution must be exercised, especially with regard to watering. It is better for amateurs always to move evergreens with an earth ball for root protection. Roots must not dry out. If they do, the plant is done for. The most auspicious moments for a shift are during one of the two growth periods: April-May and August-September, during a rainy spell, if possible. However, in my own garden I've moved small evergreens in January, February, March, April, May, August, September, October—some from my own microscopic nursery, others from reliable professional nurseries—and by careful planting and attention to watering (occasionally even shading the plants for a few days) have lost very few.

Whenever a move is made, it's a good plan to prune and correct irregularity of growth. Don't disturb the leader, particularly in the case of Pines, unless you're training plants for hedges, or for some other restricted function.

When pruning is fundamentally grasped, it loses most of its mystery. It is the cutting away of one portion of a plant in order to stimulate growth in another portion. Thus, pruning ranges from the disbudding of Peonies for the production of larger flowers by the remaining buds to the lopping-off of a complete limb on an apple tree so as to lessen competition, gain more light and air, throw strength into fruiting buds on other limbs. How and when one prunes depends not only upon the type and condition of plant under treatment but upon the goal at which one aims.

In the case of evergreens we prune to regulate size and shape; to induce better flowering; or to increase the density of growth.

Suppose a Douglas Fir (*Pseudotsuga*) is sending out side shoots which give it a ragged appearance. You don't like it. You therefore pinch them back or trim them back with sharp pruning shears. And you do this at the time of spring growth because scars will heal quickly and lateral growth will be stimulated. If, for some reason, you wanted to remove a limb, you would cut it off close to and parallel to the trunk when the tree was dormant. In conifers, new growth springs from new wood. If an old limb is removed, it will not be replaced.

You remove seed pods from Mountain Laurel and other flowering evergreens so the plant will form new fruiting buds for the following year; in other words, you prune after flowering to stimulate more flowering. But if the plant were leggy and you wanted to thicken its growth, you would probably operate on it when it started into vigorous spring growth regardless of flower buds; in other words, you'd prune back to growing points to stimulate the formation of new wood. Laurel, and most other evergreen shrubs, grow slowly. It would probably be a number of years before a Laurel pruned back for compactness would flower.

You have a Boxwood and a Mugho Pine. You want to keep them compact, dense. You therefore cut lightly at each spring growing period to stimulate twiggy growth: you shear the Boxwood; and you shorten each new "candle" on the dwarf Pine.

You have a Yew or Hemlock hedge. You wish to keep it trim and neat in appearance, its green growth thick. You therefore shear it lightly twice a year at growth periods so it will send out soft, new growth quickly. At the same time, you are pruning for another purpose: to control height and shape. While shearing, therefore, you cut to a preconceived hedge pattern.

There are no hard and fast rules of pruning. When not overdone and when cuts heal cleanly, it is not exhausting. To become expert is something like the farm boy who found the lost cow by saying to himself: "If I were a cow, where would I go?" He went there; and there she was. So in pruning you say to yourself: "If I were this plant, how would I grow?" With its habits in mind, you ply your saw or your shears and, so long as you're reasonable and don't expect a great tree to hug the ground nor a dwarf to grow tall and straight, you get the results you're after.

Don't cut for the sake of cutting, but only to train the plant or improve its natural growth. In marked degree, skill and judgment with the shears are developed by experience.

Evergreens are valuable to gardens principally in supplying the answers to questions involving (1) year-around effectiveness; and (2) shade. For landscape and border background, accent or contrast, as we've already pointed out, they're also tremendously useful.

Foundation planting—especially in the Northeast—calls extensively upon evergreens. In point of fact, evergreen massing is rather overdone. Eastern, western and southern exposures offer opportunity for color, for annuals and perennials and deciduous shrubs as well as a leaven of dwarf Pines and Junipers—the two coniferous genera which take most kindly to bright sun. No matter what type of planting is contemplated, the soil near the house foundation should always be prepared with special thoroughness. A great deal of subsoil and rubbish is likely to collect there during the course of building. Left unconditioned, the earth probably won't be suited to the growth of any plant.

Considerable cerebration should accompany base planting. Don't fling a few bargain evergreens around the front door and call it a day. A visitor's first impression is registered by what he finds at the entrance. You don't want a forest of Spruces and Firs to spring up and hide your house; nor do you want a green bib tucked under its chin. What you would like is a congenial grouping which does not appear bare in winter; which does not make the dwelling seem lopsided by overdoing the "visual weight" on one side of the entrance as compared with the other; which softens harsh lines; which makes the house fit its site; and which without crowding intensifies by color and foliage the welcome you wish your home to extend.

Let's consider the detail which might make up the entrance planting of a small home. We'll say the house is Colonial, that it faces north (to make it harder), and that a wing juts out on its west side.

First of all, we'd think of balancing the wing by a tree form, possibly a Dogwood; or by upright forms, such as a group of three columnar Yews. We'd mark the entrance with a lower pyramidal form, something a bit out of the ordinary. Kelsey's Yews might do nicely. Perhaps a Hicks's Yew or two would be needed at corners; and in between the various high points a billowing mass of Mountain Laurel or spreading English Yew (*Taxus baccata* var. *repandens,* a beautiful plant and perfectly hardy) relieved by an occasional evergreen Azalea (a white one would be unhackneyed). If a vine could be planted outside the main bed, which would be acid of course, we might consider the lime-liking Firethorn (*Pyracantha coccinea* var. *Lalandii*)—which is really a half-evergreen shrub easily trained to espalier, or vinelike, form. For underplanting, we'd select *Vinca minor* or Japanese Spurge; and we wouldn't forget to add plenty of bulbs—*Scilla nutans* and *Camassia esculenta* and *Narcissi,* perhaps two small groups of Hanson's Lilies. And we'd save room for little bays of tuberous-rooted Begonias to highlight the green with summer color.

We'd make a sketch in perspective of the proposed planting—it wouldn't matter how crude it was—and we'd change what we didn't like. We'd pay special attention to the shapes of plants and to how their forms looked when placed together and to what effect they had on the appearance of the house. And, finally, when we had settled on a scheme we liked, it wouldn't really matter if we couldn't remember the name of a single plant. In plant lists, we could find the names to match our needs. Or a reliable nurseryman, aided by the sketch and a verbal translation, could suggest plant material to make the picture come to life.

Of course, if you did plant Mountain Laurels and Azaleas and Leucothoës, you would want to provide acid, well-drained soil. You would not cultivate these plants, for their roots are very close to the surface. Instead, you'd mulch them with oak leaves or pine needles or forest compost (which some garden supply houses offer for sale by the bag). The mulch would conserve moisture and help keep the soil acid. Few members of the Heath family are tolerant of soils. Rhododendron (which includes Azaleas) and Kalmia are decidedly not. Their soil preferences are: Azalea (evergreen types), pH 4.5; Mountain Laurel (*Kalmia latifolia*), pH 4.5; Rhododendron, pH 6.0. The tolerances of most ericaceous plants lie between pH 4.5 and pH 6.0; and most of them like shade.

If your house happens to be surrounded by oak trees, conditions of both shade and soil are almost made to order for such plants. A garden can then be built around such grand subjects as Rhododendron, Mountain Laurel, Holly, Dogwood, Tree Box, Mahonia, Leucothoë, evergreen Barberry, Oak-leaved Hydrangea, Lilies, Mertensia, Bleeding Heart, Narcissus—a host of splendid things, including many perennials (see Chapter VI). If shade is your problem as well as your opportunity, I recommend that you read Mrs. H. K. Morse's *Gardening in the Shade*. Its plant lists are thorough and its photographs inspirational.

To a certain number of evergreen, or half-evergreen, shrubs, not detailed elsewhere in this book, special attention might well be directed. Under proper conditions, they may strike an unusual and appealing note in small gardens:

KALMIA (American Laurel): Mountain Laurel (*K. latifolia*) is perhaps our best broad-leaf evergreen. Acid well-drained soil; prefers shade, with sufficient moisture will grow in sun; 4′ to 10′, May-June, pinkish white. Carefully dug small plants may be transplanted from the wild in early spring or fall, but nursery-grown plants are better.

Sheep Laurel (*K. angustifolia*), 2′ to 3′ June-July, purplish-pink, is a seldom planted, rather pleasant little shrub. Leaves of all Laurels are said to be poisonous to animals, especially Sheep Laurel. Another common name for it is Lambkill.

RHODODENDRON (Rosebay): In addition to acid soil, Rhododendrons need protection from winter sun and drying winds. The species *Rhododendron maximum*, for which the Poconos are famous, is too large for small gardens for it sometimes reaches 35′. However, the compact *R. carolinianum*, 6′ to 8′, May-June, light to deep pink, is a good species for limited grounds. The flowers of *R. catawbiense* in forest shade are lilac-purple and beautiful but in more open garden areas are magenta and pretty terrible. From this species some fine hybrids have been developed—clear pink, white, red.

The Azaleas, which are species or hybrids in the genus *Rhododendron*, are—particularly evergreen types—small-leaved, dwarfish and compact, have small flowers and many of them. Colors are brilliant white, pink, all manner of reds and salmons. For some reason Azaleas and Rhododendrons usually clash when planted together, perhaps a matter of scale primarily. The safest way to acquire either is to pick out individual plants in bloom. Frequently they are blooming when dug and offered for sale (B & B).

LEUCOTHOË (Leucothoë): Interesting southern native, hardy north, 4′ to 6′, fragrant white, April-May. Graceful foliage turns purplish-bronze in winter. *Leucothoë Catesbaei* perhaps the best species. Acid soil, shade preferred. Combines beautifully with Azalea, Mountain Laurel, Rhododendron.

BERBERIS (Barberry): Half-evergreen hybrid *Berberis Mentorensis*, erect to 5′, tolerant of soil, sun, shade, is a decorative and valuable plant. The 2′ to 3′ spreading species *B. verruculosa* is a very fine small evergreen. Dark green lustrous foliage resembles holly.

CALLUNA (Heather): Scotch Heather (*C. vulgaris*) is a 1′ to 2′ evergreen flowering shrub requiring sandy, acid soil, sun. Not too easy to grow, but perhaps more tolerant than Heath (*Erica*). The two genera are much alike and often confused.

COTONEASTER (Cotoneaster): Ornamental plants belonging to the Rose family. Need well-drained garden loam and sun. Spreading Cotoneaster (*C. divaricata*) is a handsome deciduous species, 6′ to 8′, with bright red fruits which hang on the branches a long time. Rock Spray (*C. microphylla*) is perhaps the most useful evergreen species, prostrate, May-June, white; bright red fruits, glossy leaves.

ILEX (Holly): American Holly (*Ilex opaca*) is the tallest of the broad-leaved evergreens, occasionally reaching 50′. Rich, well-drained soil preferred, light shade. Strip off leaves when transplanting. Only female plants have berries, therefore plant mostly pistillate plants and a few staminate ones. Slow of growth, stands pruning well, wonderful hedge in right situation.

Shrubby Japanese Holly (*Ilex crenata*) has black berries. It is an excellent evergreen, in particular its variety *microphylla* which is hardier than the type.

OSMANTHUS AQUIFOLIUM (Holly Osmanthus): This species, a shrubby evergreen to 20′, in a sheltered position is hardy as far north as New York. Fragrant small white flowers, June-July.

MAHONIA (Hollygrape): A few species are hardy north. Uusually ragged growers; winter sun burns foliage. Average well-drained soil, sheltered position. Leathery leaves suggest holly; flowers are fragrant; blue-black fruits fairly interesting. Best looking is Oregon Hollygrape (*M. Aquifolium*), 3′ to 6′, yellow flowers in May, small blue berries. Hardiest is *M. repens*, 6″ to 12″, spreading; good ground cover in humid soil.

PIERIS (Andromeda): Mountain Andromeda (*Pieris floribunda*), 2′ to 6′, April-May, white, is a native of the Alleghanies. Japanese Andromeda (*P. japonica*) is a tree-like shrub to 30′, generally much smaller in gardens. Good foliage, graceful panicles of white flowers like Lilies of the Valley, April-May. Hardy as far north as Massachusetts, though flowers often winter-kill in north. Humid, well-drained acid soil.

EVONYMUS PATENS (Spreading Euonymus): An upright but spreading half-evergreen species, 6′ to 8′, pink fruits followed by development of seeds covered with conspicuous red-orange seed coats. Indifferent as to soil; hardy as far north as New York. Interesting hedge possibility.

Summary of Chapter IX: *Evergreens, defined as plants that retain green foliage the year around, may be divided into two main classifications: Coniferous Evergreens and Broad-Leaved Evergreens.*

Nursery-grown evergreens are easy to move up to 6′ tall. Because of weight of earth ball, taller plants may need special equipment and trained men. Operation of home evergreen nursery feasible and, by patience, may save money. Japanese Yews in small sizes especially easy to manage. Careful transplanting may be accomplished almost any time, but spring and fall growth periods are most auspicious.

Pruning is the cutting away of one portion of a plant to stimulate growth in another portion. Evergreens are pruned to regulate size and shape, to induce better flowering, to increase density of *growth. Skill and judgment improve with experience.*

Evergreens help solve problems involving year-around effect and shade. Useful in foundation planting, but importance of balancing masses and of color should not be forgotten. A sketch is a practical aid in planning, even if crudely executed.

The combination of shade and acid soil is a special problem, offers special opportunity. Many splendid plants enjoy such conditions—Rhododendron, Mountain Laurel, Holly, Dogwood, Tree Box, Mahonia, Leucothoë and many others, including many in list of evergreen and half-evergreen shrubs of special interest to the small garden.

CHAPTER X

POOLS AND ROCK WORK

The Besetting Sin of Incongruity; Architectural Integrity in Pools, Rock Work, Teahouses and Other Features; How to Determine the Type of Pool Required; Dangers of Amateur Rock Gardens; Wall Gardens and Pocket Planting; Summary.

During the past several chapters, we've borne down on plant detail—shrubs and annuals and perennials and bulbs and evergreens. There remain for discussion two provocative garden features: pools and rock work. But, before they're considered, one factor in garden making must be stressed because it controls, or should control, the form and extent of water and rock gardening permissible in a limited landscape.

In small gardens, restraint is as essential to success as a stag line at a debutante party. We cannot at any one time grow all the plants we should like to try. We cannot include all the features we should like to include. Restrictions of space and style and topography, if nothing else, force us to weigh our enthusiasms, to be discriminating in our choices; in short, to practice an art rather than indulge in an orgy. Lack of garden discipline results in jumbled and restless planting, or (which is worse) in crowding into the area under our command man-made features which are pleasant enough individually but in association with each other are definitely on the grim side. Over-reaching ambition begets incongruity.

Through basic design, such as was outlined in Chapter I, terraces, teahouses, outdoor furniture, flower boxes, steps, walls, pools and all such inanimate adjuncts must be related to each other. Yet that is not all. Degree of ornamentation or sophistication, construction materials and similar details must conform to a single standard.

A marble terrace attached to a shingle cottage is discordant—no matter how admirable the terrace or the cottage, when examined separately. A rustic gazebo is inappropriate to the refined severity of a Georgian home of brick. A naturalistic pool is out of place in a geometric garden. A rock garden is unsuited to a formal landscape. A rustic pergola does not belong with a Spanish type of house. Garden features must fit together, must be cut out of the same cloth. A place, in other words, must be planned not only for visual unity; but the plan must be so executed as to produce architectural, or structural, integrity.

Even a smart person may trip over this wicket. Here is an example of how too keen an interest in one garden feature, through loss of perspective on the whole, resulted in subtle incongruities. While these didn't perhaps utterly ruin the garden picture, they did mar an otherwise nearly perfect one.

The owner of a simple but charming Colonial house bought an adjoining lot in order to build a garden upon it. The new lot was lower than the old one; and it was decided to capitalize this fact by creating a sunken garden. A careful design was made, setting up an axial relation between the house and the proposed garden and specifying, as terminus to the axis, a teahouse. In order to insure harmony between the new project and the period of the existing house, the teahouse was planned as a copy in miniature of the residence porch.

Everything went smoothly until the teahouse was built. The garden was located with precision. Its long axis bisected an existing glassed porch, which tied it in with the house; at the same time the axis passed through the center of the new garden steps, which made access easy and natural. Its retaining walls were fashioned of field stone so as to agree with the simplicity of the existing building. In the meantime, however, the garden's owner had picked up at low cost a fine cast-iron panel. She fell in love with it. Nothing would do but to match this panel (an undertaking which turned out to be anything but a bargain) and with the collection to erect the teahouse. The ironwork would be painted white. She had seen one like it in New Orleans. Wouldn't it be beautiful? And, since the teahouse was going to be such a joy forever, it also must have a copper roof.

So far as the teahouse alone was concerned, the owner was not disappointed. It did prove to be handsome: far too handsome, for it crowed over its surroundings like Chanticleer over his drab little hens. It made the retaining walls seem clumsy, though they might have been assisted in the job of living up to the teahouse by a coat of white paint. It looked down its nose at the residence. And by contrast caused that amiable, unpretentious house to appear not forthright and unaffected but awkward and graceless. The teahouse—a fine thing in itself—was out of step with its environment. It was a gorgeous incongruity.

By the same token, a pool of the wrong kind may be a disturbing element in the landscape instead of an agreeable one. Pools are of two sorts: formal and informal. A sophisticated pool in a semi-wild hillside garden is as out of place as a naturalistic pool on a flagstone terrace. For some type of pool, however, there's always an opportunity. Small pools are very easy to manage. Since they contribute so much through an illusion of coolness, or by repeating sky and garden patterns, or by making possible the summer glory of Water Lilies, they should always be contrived.

A naturalistic pool need be hardly more than a shady haven for birds. When a shallow place in which they can bathe without fear is provided, it's astonishing how many songsters will be attracted. But Water Lilies demand sun for development. A pool in which they are to be grown needs full sun. The less shade, the more the Water Lilies like it.

Most pools are constructed of concrete. Other material, such as sheet lead, may be used. One water garden specialist advertises an all-steel pool —4′ x 7′ x 18″—complete with fishes and scavengers and lilies and other water plants for $26.00. All you have to do is dig the hole, slip in the steel box, fill it with water, and add fish and snails and plants. However, concrete—reinforced if the pool sides are straight—is very satisfactory. A new concrete pool must be filled and emptied several times to wash out excess alkali before liberating fish; and it will reflect better and look cleaner when it has been painted with asphaltum. A special blue paint, harmless to fish, is available. But in lily pools the black asphalt paint helps the water appear deep and clean in spite of the presence of a small amount of decaying vegetation, most of which tadpoles consume.

A lily pool in large measure takes care of itself. The pool is not drained usually oftener than once a year, for lilies prefer warm water. Water can be siphoned out; or some seepage device, such as a dry well, may be contrived. But so long as the right balance between snails, tadpoles and goldfish on the one hand and underwater oxygenating plants and lilies on the other is maintained, the water remains pure and clear. One operates what amounts to an outdoor balanced aquarium.

Early in the season before oxygenating plants—like Anacharis and Cabomba—have had time to make much growth, the pool may become clouded with algae (green scum) which is freshwater "seaweed," minute flowerless plants flourishing in sunny water. Occasionally, it may be necessary to rid the pool of algae by treating it chemically. Either a named preparation sold by water garden specialists may be applied, or potassium permanganate crystals (the old-fashioned snake-bite remedy procurable at all drugstores)—enough to turn the water a light pink. The algae disappear in a day or so, after first sinking to the bottom. A second application of chemicals is rarely necessary. Snails and tadpoles eat algae and, when oxygenating plants are large enough to counteract the formation of much of it, the scavengers keep even with its production.

Goldfish, of course, lend animation to a pool.

Their main function, however, is to devour insects, particularly the eggs and larvae of mosquitoes. It is highly probable that the presence of a balanced lily pool greatly diminishes the number of mosquitoes in a neighborhood. The pool invites the egg layers. But such eggs as are laid, thanks to the always hungry goldfish, never reach the mosquito stage. Both plant and animal essentials for pools may be secured from water garden specialists. None is better known than William Tricker, Inc., Saddle River, N. J., or Independence, Ohio.

The best way to grow Water Lilies is in containers—large boxes or tubs or pots—rather than in soil dumped on the pool's bottom. The soil should be rather rich. I have grown them to perfection in cypress boxes—24″ x 24″ x 12″, one lily to a box—filled with spent mushroom soil. A rich compost of cow manure and topsoil should prove equally effective. Six inches of water over the crown is sufficient; and to help keep the water clear, it is customary to spread over the soil an inch of sand or gravel to prevent fish from stirring up little clouds of mud.

In some measure, the extent of the lily's growth depends upon the size of the pot or box. Experience leads me to recommend a large container of rich soil and an allowance of 25 square feet of surface area for each lily, which is rather more than most growers indicate as necessary. Avoid too much plant material, if your pool be formal. The pattern made by blossoms, buds and pads, and the mirror-like quality of the water represent garden values which should not be lost.

Water Lilies are of two types: day-blooming hardy lilies; and day-blooming and night-blooming tropical lilies. All water lilies are beautiful and most of them are fragrant. The hardy sorts live over the winter outdoors. The tropicals, unless they can be moved to a greenhouse pool, do not withstand the cold. They are best treated as annuals and renewed every year. The differences between the two types are principally as follows: Hardy lilies are seasonal, begin to bloom in May or June and are usually over in July. Tropical lilies, set out as young plants about June 1, are in bloom in three or four weeks and continue until cold weather kills them. The leaf of hardy sorts is smaller, the blossom more rounded; both leaf and blossom rest upon the pool surface. Tropical blossoms are borne on stiff stems several inches above the water line.

Neither type is much troubled by disease or insect, though aphis now and then may attack the leaves. Simply wash them off with the hose to make a meal for the fish. Do not use a contact insecticide on them, for it may also destroy your fish and tadpoles.

Hardy hybrid lilies come in pink, rose, apricot, salmon, yellow, white, red. Tropical lilies are available in similar tints; and in addition may be had in splendid blues and purples. I have grown a great many named varieties. I have yet to be disappointed in one. Hardy hybrids cost from 75 cents to $2.50 each; tropicals, from $1.00 to $3.00 per plant. Since two tropical lilies, grown in big containers of rich soil, will furnish a succession of truly magnificent flowers and are sufficient, I think, for a pool 5′ x 10′ x 18″, they can hardly be considered expensive. The cost of the pool itself depends, naturally, upon the type built; but very good ones can be constructed for $35.00 to $40.00 —or less, if you are able to do most of the work yourself. An outstandingly good book covering structural details is *Garden Pools: Large and Small* by L. W. Ramsey and C. H. Lawrence.

Perhaps attention should be called to a few named varieties of great merit. While doing so, however, I repeat that disappointment in any Water Lily secured from a reliable grower is virtually unknown. I do not believe you can say that for any other flower, unless it be Narcissus.

Hardy Water Lilies: Pink Opal, pink; Chromatella, yellow; Comanche, bronzy apricot; Gladstone, white; Gloriosa, red.

Tropical Day-bloomers: Blue Beauty, blue; General Pershing, pink; Mrs. Geo. H. Pring, white; August Koch, purplish lilac.

Tropical Night-bloomers: Frank Trelease, red; Mrs. George C. Hitchcock, pink; Missouri, white; St. Louis, yellow.

Very little experience is needed to grow Water Lilies well. They behave splendidly even for the novice. And they require no sprinkling, no cultivating, no weeding.

Various methods of winter covering are suggested from time to time by pool enthusiasts. Boards may be placed over the pool and upon them may be piled salt hay; half the water may be drained off and leaves, to counteract alternate freezing and thawing, may be added to the pool's contents; fish and snails may be carried through the winter in an indoor aquarium and hardy lilies left in the pool with enough water to prevent them from drying out. Yet I must truthfully confess that I've fared just as well, have brought through the winter just as many hardy lilies, snails and goldfish, when I've done nothing more than break the ice once in a while. In the spring, the pool is cleaned out; checked for leaks; grouted if need be (that is, coated with a pasty mixture of cement and water to close small cracks); painted with asphaltum; replanted and restocked for another season of subsequently almost effortless satisfaction.

Rock gardens may be superb. Yet under average garden conditions even a fairly good one is as rare as a politician's unbroken promise. Genuine rock gardens are suited to few small places. Moreover, rock gardens of merit seldom are designed by amateurs; nor, for that matter, can every landscape architect plan and execute good rock gardens. They entail a specialized and intensive and interpretative study of nature. In the hands of a Frederic H. Leubuscher, they emerge as natural faulted ledges made unforgettable by artistic competence. But when attempted by the ordinary untutored soul, so-called rock gardens fall but little short of unmitigated desecration. They are cairns upon which good taste has been sacrificed.

Apart from deficiencies in training, amateurs seldom have access to suitable rock, facilities for handling the large sizes necessary to interesting work, or perception of the differences between rock piles and rock gardens. Rarely, too, does the topography of a small place afford opportunity.

Nevertheless, there is a type of rock work which amateurs may handle adequately: dry wall gardening. This, fortunately, is both suitable and applicable to many different situations. While marked departures from nature in dry walls are frowned upon, rock work of this sort is sufficiently functional to permit considerable leeway and therefore to reduce the possibility of irreparable error.

Dry walls, in essence, are retaining walls laid up without mortar. When crevices and seams have been planted, for the most part, with dwarf spreading perennials and tiny ledges house minute bulbous plants a most attractive picture is created.

A low wall, or a series of low walls, thus gardened suffices to satisfy the rock-gardening inclinations of most of us.

When less than five feet high, dry walls are quite simple to build. Flattish rock is selected and each crude course, as it is laid, is stepped back two inches. Behind the wall is deposited rich compost at least a foot thick, into which plant roots should find their way. Not only does the face of the wall slope backward but each stone should also be set so as to slant downward and so direct rainwater into the reservoir of good soil back of the wall. Some writers advocate planting the wall while it's under construction; others recommend planting after completion. It has been my experience that equally good results are secured by either method; and that convenience, consequently, may determine the time of planting.

Pocket planting on steps and terraces, which is helpful in breaking up by means of plant foliage an otherwise monotonous line, is just another application of dry wall technique. An opening is left in step or terrace. This is filled with enriched topsoil—about 12 inches deep—and planted. The plants most suitable will depend upon the degree of formality of terrace or step, but, at the outset in pocket planting or dry wall planting, readily available perennials might very well be selected from local nurseries. Such plants are frequently useful in the border edging or foreground as well. (See Chapters V and VI.) As experience is gained, rarer Alpines may replace those plants which to you seem dull or hackneyed.

Few annuals are suited to any form of dry wall or pocket planting. There is, however, one rather notable exception: *Portulaca grandiflora.* In a spot so sunbaked as to shrivel anything but a species Tulip, Portulaca all summer long will greet the heat with hard, bright color.

Summary of Chapter X: *Restrictions of space, style and topography control form and extent of water and rock gardening permissible on a small place. Gardens must be planned for visual unity; and so executed that details conform to a single standard. Lack of discipline results in incongruities.*

However, a pool of some type may always be contrived. Pools are easily managed; create an illusion of coolness; reflect sky and garden pat-

terns; make possible the summer glory of Water Lilies.

Water Lilies grow well in warm, shallow water and rich soil. Permanent pools, usually of concrete, need not be expensive. A balanced outdoor pool almost maintains itself. No sprinkling, no cultivating, no weeding is required. Disappointment in Water Lilies is virtually unknown.

In the hands of experts, rock gardens may be superb. When designed and built by ordinary souls, they are more likely to be cairns upon which good taste has been sacrificed. Few small places are naturally suited to rock gardening.

Planted dry walls and pocket planting on steps and terraces may be handled adequately by amateurs and suffice, in most instances, to satisfy the rock-garden urge. Plants used are chiefly low, spreading perennials. One annual—Portulaca—is helpful in dry, sunny spots. It matches blistering heat with bright blossom.

CHAPTER XI

GARDEN EQUIPMENT

How to Save Time with Modern Tools; A List of Good Tools and Accessories; Fundamentals of Winter Protection; Control of Insects and Diseases; The Gardener's Five-Foot Shelf.

The condition of its cold frames, so it's been alleged, to an expert reveals the degree of excellence of an unseen garden, just as the colors on a painter's palette furnish a clue to the worth of his finished work. Applied to small gardens, such an observation loses force since professional growers may raise many plants for them. Yet a definite relationship does exist between good gardens and good equipment. Let us then take up—one after another—four types of what I believe to be essential garden equipment.

First come tools and accessories for working the soil and handling the floral crop. The most practical and helpful way to cover the subject would appear to consist in furnishing a list. But, before compiling it, I'm convinced I shall be doing a favor for many an exhausted garden maker by calling particular attention to timesaving tools based upon a relatively new principle.

Tools worked by pulling in place of chopping, if I'm not mistaken, were first manufactured a few years ago in Germany. They were well made but a bit heavy; and, due to import duties, were rather costly. Improved tools, based upon the same labor-saving physical laws, are manufactured in this country: in particular, by Gardex, Inc., Michigan City, Indiana. These tools are now widely distributed; are low in price; light in weight; speedy beyond belief. I have tested them thoroughly. And I do not hesitate to recommend Gardex tools without stint.

The worker stands erect when using the long-handled types of these modern tools. He operates them with a motion not unlike sweeping. He walks backward away from the soil he has just worked, instead of toward it as is the case with old-fashioned hoes and cultivators. When the soil is mellow, a border may be lightly cultivated—so I have proved to my own satisfaction by actual time tests—with less effort and at rates of speed *four times faster* than was possible with standard hoes or cultivators. An increase in efficiency of 400 per cent is certainly not to be sneezed at.

All the tools and accessories on the following list will not be needed for your garden perhaps; but the inventory may help you to correct some deficiency you've scarcely been aware of, aid in conserving your time and energy, and thus add to your enjoyment of the most beneficial of the arts:

Lawn Mower: better traction is provided by rubber-wheeled types; detachable Grass Catcher will also be needed.

Lawn Edger and Trimmer: something like a one-wheeled mower, permitting cutting close to trees and fences, a great timesaver.

Lawn Sprinkers: several will probably be needed, Water-Fan and several whirling types are good; a

Flaring Rose or other fine spray for seedlings will be useful.

Lawn Roller: water ballast type recommended.

Turf Edger: Gardex No. 400; several wheel types, including Edger and Trimmer, are good.

Sod Lifter: occasionally needed.

Sod Tamper: reversible spike type is good.

Mechanical Seed Sower and Fertilizer Spreader: a great help in building good lawns.

Grass Hook (Sickle): occasionally needed.

Garden Hose: arrange outdoor faucets so that not more than 50′ of hose must be handled from each faucet and so hose can be hidden behind shrubbery—looped in figure 8 which avoids kinking. If uncoupling cannot be circumvented, automatic hose couplers save time and annoyance.

Wheelbarrow: light weight steel with pneumatic rubber tire, will not seriously track lawn; also Wire Rack for carrying leaves or other garden trash which can be transported in the barrow.

Work Gloves: Eezy-Wear, washable and excellent; for softening the hands when roughened by contact with the soil, Hanton or Chamberlain's Lotion.

Weeders: many types available; an Asparagus Knife makes a good hand-weeder, especially for removing dandelions or plantain from lawns. In beds and borders cultivator should get weeds while they are very small.

Pruning Shears: 1 Doo-Klip Grass Shears; 1 hedge, 1 pruning; best grades are cheapest in the long run; electric shears excellent for formal hedges.

Pruning Saw: unless you have fruit trees, small household saw might do.

Tree Wound Paint: protection during healing of pruning cuts.

Pruning Ladder: or Step-Ladder.

Garden Mattock: occasionally needed for heavy work.

Garden Fork: D-handled, generally better for deep cultivation than spade because it is less likely to injure roots.

Garden Spades: 1 long-handled spade; 1 or 2 D-handled spades, chiefly used in transplanting shrubs and trees and should be heavily strapped; 1 Drain Spade for transplanting perennials.

Garden Hoes: 1 common draw hoe (seldom used but sometimes needed); 1 scuffle hoe; 1 Gardex No. 110 Pull Hoe Weeder.

Garden Cultivators: 1 short-handled cultivator for window and terrace boxes; 1 Gardex No. 1553 Cultivator for heavy soil; 1 Gardex No. 1503 Cultivator for light or well-conditioned border soil.

Garden Rakes: 1 well-balanced steel rake; 1 wire broom rake; 1 Gardex No. 254 Roller-Rake for seeding, lawn repair and other light operations.

Garden Pulverizer: Planet Jr. Star Pulverizer, Leveler & Weeder; new Gardex models should also be interesting; valuable in seed bed preparation.

Garden Trowels: 1 Wayside model; 1 standard garden trowel (available in stainless steel); 1 Slim Jim model, particularly useful in naturalizing bulbs.

Hole-in-One Plant and Bulb Setter: hand type, used almost as often as a trowel, makes a flat-bottomed hole; Gardex No. 750 Hollow Planter—a dibble forcing out the earth through its top—is also good.

Plant Stakes: Japanese cane stakes, dyed green, are strong, cheap, inconspicuous.

Raffia: undyed preferred, for tying plants loosely to stakes. First tie raffia to stake, then loop plant lightly, then tie again to stake. Special twines also good. Hairpins and florists' annealed wire good for grape-tying and similar operations.

Garden Reel and Line: must be used occasionally, but mark points permanently with sunken pipe to save time in setting up straight line as edging guide.

Flower-gathering Basket: flat type; Picking Buckets or Pails are also first-rate.

Flower-gathering Scissors: Original Garden Club model, also valuable for light pruning, disbudding, or pinching-out.

Fertilizers: supply should be kept on hand of such materials as spent mushroom soil, dried dungs, commercial plant foods, bonemeal, Driconure.

Sharpening Stone: also can of 3-in-1 Oil.

Tool Rack: portable steel rack or homemade, helps keep equipment in order.

Cold Frames: half-size frames are more easily managed, especially by women, than standard sizes. Also Keene Plant Starter, which amounts to a miniature, portable, thermostatically regulated greenhouse, is fine for an extra early start.

Shading Equipment: laths; peach and strawberry baskets for shading young transplants.

Seeding Equipment: seed flats, azalea pots (for fine seed), glass substitute, tin snips, seed sower, burlap or newspaper, labels and label pencils, charcoal, 2-inch pots, watering pot, rubber plant sprinkler, bread pan (for bottom-watering), brass dibble, flat board equipped with handle, riddle, supply of soil—Steriloam, commercial humus, sand, peat moss, garden loam, kept in open trash cans or bins—should be on hand for seeding operations. A home-made portable seeding bench made of redwood will be appreciated if much seeding is undertaken, either indoors or out.

Winter protection is necessary to insure the life of either recently moved or unreliable hardy plants. It is more important to understand *why* one covers in winter than to be familiar with typical protective materials.

What do we seek to guard against? Cold? No, not the cold. We cover to keep in the cold rather than to exclude it. We protect from sudden changes in temperature, from the heaving resulting from frost action, from premature growth induced by winter sunlight. Any sterile, light, porous material —it must be airy so that water won't collect about a crown and rot it—put on *after* the ground freezes and removed, bit by bit, as spring growth starts is likely properly to meet requirements.

Snow is considered an ideal winter mulch. But snow cannot be ordered up as desired, like ice water in a southern hotel. However, a very close imitation is now available: glass-snow. It comes in rolls, does not splinter, can be used for several seasons. Salt hay, peat moss, compost, oak leaves—held in place if need be with chicken wire or small branches—are standard mulching materials.

Insects and diseases, as all who garden learn to their sorrow, in the course of time victimize virtually all plants. To plant resistant species; to furnish sound soil conditions; to allow space for the proper development of individual plants and to provide for the free circulation of air: these are constructive steps. Yet they alone cannot always suffice. If foliage and blossom is to be at its best, active chemical warfare must be waged against the enemies of the plant kingdom. And to have on hand equipment and materials with which to ward off attack is therefore of the essence of good gardening.

Reduced to simplest terms, the main types of despoilers are four in number. There are others—virus diseases and lapping insects, for example—but these are the chief offenders:

1. Fungus: primitive, parasitic plant forms such as molds and mildews and rusts.

2. Scale: tiny insects which protect their tender bodies by self-secreted hard coverings.

3. Chewing Insects: the all-too-familiar cutworms and caterpillars and beetles.

4. Sucking Insects: principally the aphids, or plant lice, which puncture new growth, suck plant juices, seriously weaken the plant and may render it liable to fungus attack.

Fungi and scales are both controlled by a *dormant spray*: that is to say, a compound which is applied during the time *when plants are leafless.* Chewing insects are controlled by poisoning their food: that is, by applying to the foliage on which they are feeding a *stomachic insecticide.* Sucking insects are controlled by hitting them with a compound which suffocates them, a *contact insecticide.* Because they must be struck by the spray or dust, it is especially important to make sure a contact insecticide reaches the *lower* as well as the upper surfaces of leaves.

The standard dormant spray is liquid Lime-Sulphur. The standard general fungicide is Bordeaux Mixture. The standard stomach poison is Arsenate of Lead. The standard contact insecticide is Nicotine Sulphate. The last three are poisonous to man; Lime-Sulphur smells to high heaven and leaves a black stain which disappears within a few days.

Materials which are not poisonous to man (or his dogs and cats) but are lethal to insects and cold-blooded animals include Pyrethrum and Rotenone. The two may be combined with each other, or with sulphur, as spray or dust. Pyrethrum, derived from a perennial herb, is a contact insecticide. Rotenone is extracted from the roots of tropical plants, known as derris or cube, and is a stomachic insecticide. It is said to be more powerful than lead arsenate but deteriorates more rapidly upon exposure to air.

A supply of materials is either kept on hand for use when need for it is demonstrated or, as many gardeners prefer, a weekly spraying schedule is more or less adhered to. A combination of pyrethrum and rotenone will go on one week, perhaps, followed by a combination of sulphur and rotenone the next. In any event, not only compounds but devices for applying them must be quickly available. Sprays are considered more effective than dusts because they spread better, cover more completely. Dusts, however, don't require mixing before use. It is sound practice, therefore, to keep a dust gun—preferably one in which the dust supply is visible—loaded and ready for emergencies; and, for more thorough routine spraying, a compressed air type of sprayer of from 2- to 4-gallon capacity.

Baited traps are used against certain marauders —the fiendish Japanese beetle, for instance. Prepared meals are served frequently to slugs and cutworms—Snarol is one good one. Ant colonies are effectively disposed of by pouring undiluted Red Arrow (pyrethrum concentrate) down their burrows, or by the rather magical Lethelin Jelly. For Roses, a combined insecticide and fungicide called Triogen has become virtually the standard. And there are many other good "patent medicines," not to mention the outdoor lantern which electrocutes all manner of night-flying pests.

Not all insects are harmful, you know. Bees and wasps and ladybugs and ground beetles and the strange praying mantis all fight on the side of man. Nor will every disease and insect respond to routine control. If your garden is visited by some out-of-the-ordinary pest or malady, consult your state agricultural experiment station, the United States Department of Agriculture, or some other reliable authority.

The fourth type of equipment is intellectual. But don't forget that it is, at the same time, intensely practical. This is the printed word: catalogs, magazines, books.

Gardening is anything but a static art. Styles change. New plants appear. For full enjoyment of his hobby, a gardener keeps himself informed. His name is on the mailing lists of most of the good professional seedhouses, nurseries and supply firms. If he does not purchase from them periodically, he won't mind paying the small fee some of them charge for he knows catalogs are expensive to print.

He subscribes to several magazines. *Real Gardening,* because it carries no advertising, grinds no axes, is written by professional horticulturists; *Garden Digest,* keenly edited by the talented

Dorothy Biddle and enlivened by Dr. Herrick's "The Digest Gardener's Corner"; *Better Homes & Gardens,* for the Plain Dirt Gardener and Alfred Hottes and all the helpful articles which have earned its 2,000,000 circulation; *House & Garden,* for suave Richardson Wright; *House Beautiful,* for ingenious layout and practical garden department; *The Flower Grower,* for detailed varietal information—in all these, and others, the gardener finds encouragement and entertainment and inspiration each month of the year.

I sometimes wonder why anyone who has sufficiently mastered the rudiments to begin to use Professor Bailey's *Standard Cyclopedia of Horticulture* and his concise *Hortus* should ever buy another garden book. These volumes have everything but sex appeal. Yet, as I set down the words, sixteen other garden books eye me reproachfully; and on my library shelves are many more to join them in resenting the calumny.

In truth, I should not like to have foregone the experience of meeting any of them. Each gave me something of lasting value—in vicarious adventure, in stimulating viewpoint, in better understanding. I am glad that F. F. Rockwell and

J. Horace McFarland and M. G. Kains and Marie Luise Gothein and the star-spangled Beverley Nichols are more than names to me. I am privileged to have known through their books the scholarly Leonard Barron, the pungent Karel Capek, the gifted spirit which was Louise Beebe Wilder. I should have been unwittingly the poorer had I failed to read Professor E. J. Salisbury's great book, *The Living Garden,* which with believe-it-or-not excitement relates the science of botany to the parallel art of horticulture. And deprived of my notebook—*A Year in My Garden,* which is both diary and guide compiled by Professor Paul W. Dempsey of the Massachusetts State College—I should be as incomplete as a clock without a minute hand.

Build up your garden libraries, I urge you. Gather your printed friends about you. Make of them the companions so many deserve to be. As your five-foot shelf fills, so will you grow in horticultural grace. Let the wisdom of Andrew Lang light your way to contentment:

> I'd leave all the hurry, the noise, and the fray,
> For a house full of books, and a garden of flowers.

CHAPTER XII

GARDEN CALENDAR

What To Do and When To Do It—A Chronological Sequence.

A Garden Calendar is a reminder which cannot hope to be accurate. Seasons vary. Conditions differ not merely in separate sections of the country but within the same small plot. Yet cultural calendars do reinforce the memory; and thus they may make for better routine garden maintenance.

In a very general way only is it true that the planting season advances toward the north at a rate of 100 miles on the level (or 500 feet of altitude) per week. Not latitude and height above sea level alone but the basis and complexion of soil, prevailing winds, rainfall, proximity to large bodies of water and all manner of ifs, ands and buts modify general rules. Farmers and other commercial growers with an eye to an early market regulate their schedules by the United States Weather Bureau forecasts. But for the makers of small gardens, to whom a difference of a few days one way or another can matter very little, condition of plant growth or other natural signs are by far the most practical and reliable guides. "Annual: sow outdoors when maple leaves are expanding." Such directions as this you'll find printed on your seed packets. Observe them and you're not likely to go wrong.

The following calendar, which includes nature signs when they seem genuinely helpful, applies to the latitude of New York City. You may discount its dates to conform to your own situation. Blank spaces in parentheses are provided for that very purpose. If you wish, you can write in your particular dates. Only by keeping notes on your garden, however, can you hope to evolve the most beneficial individual routine. On a great many operations, of course, several weeks' leeway is permissible. Within limits, exact times for doing garden work are determined by convenience and weather.

The real value of a garden calendar reposes not so much in approximate dates as in chronological sequences. The question before the gardener is as often "What may I do next?" as it is "When may I do thus-and-so?" Dates vary according to locality, and from season to season. But the Lilac always blooms before the Rose. Spring rains always precede the floral generosity of June. Natural sequences—and by the same token cultural sequences—change very little, if they change at all.

January, *The Month of Catalogs:* Begin to make up your seed lists. Determine this year to try at least one new annual, one new perennial, one new bulb.

Don't forget to water the potted Gardenias. They require much moisture. Be methodical about house plants. Examine them every day. Keep the soil damp but not wet. Syringe them occasionally; but don't wet woolly (tomentose) leaves.

If in the past you've been content to jam flowers into a vase any which way, read Dorothy Biddle's *How To Arrange Flowers* and catch up with the times. Even a man can appreciate this book. Skim through your last year's notebook for jobs left undone. Start your new book.

About January 15 (   ) on any calm day when the weather is temporarily bearable, burn over Bearded Iris to destroy eggs of Iris Borer. Put on a very small amount of excelsior, sprinkle with kerosene and set fire. Quick flame won't hurt the rhizomes. Do this before Iris growth starts. It is the only satisfactory control measure.

About January 20 (   ) check winter covering. Some material may have blown away. Fix it before the "January thaw," or small plants may be heaved right out of the ground. Keep snow off evergreens. Break the ice in the Lily pool so the water won't become foul.

Take an impartial look at your grounds when there's no bloom to fool you. Perhaps some section needs an evergreen accent, a sounder design. Try working out an improved scheme on paper.

February, *The Month of Planning:* Again check over your seed lists. You probably should cut your order in half. You know you'll never plant all those things.

About February 10 (   ) bring in some shrub branches for forcing in water: Forsythia, *Deutzia gracilis,* Japanese Quince. Place in deep water in a cool room. Bring into warm room as buds begin to break. If you wish, you may hasten the process by spraying the branches with warm water. Have a look at your Rhododendron, Mahonia, *Daphne Cneorum.* They may need shading to prevent sun-scald.

By February 15 ( ) begin forcing the last of your Paper-White Narcissus bulbs in pebbles and water. Put a lump of charcoal in the water to prevent unpleasant odor. Finish dormant spraying with Lime-Sulphur. Pay special attention to Peaches, Apples (especially Bechtel's Crabapple), White and Mugho Pines, Lilacs, Euonymus.

Before Washington's Birthday ( ) prune fruit trees and grapes. Paint cuts larger than ½″ in diameter. Prune back Hydrangea, Clematis, Rose of Sharon (*Hibiscus syriacus*), if you didn't get around to them in January, to cause formation of new wood. Prune Silver-lace Vine (*Polygonum Aubertii*) while dormant, principally to control its spread. Pick a day when the temperature is above 40 degrees—for plant health as well as your own comfort.

Around February 28 ( ) you'd better

look over stored material, if you have any: dahlias, gladiolus corms, tuberoses. Best storage temperature is 40 degrees which is hard to find in modern houses. Cut rot out of tubers. Dust cuts with powdered sulphur. If tubers are shriveling, sprinkle the peat moss in which, presumably, they're packed.

Mail that order for seed and perennial stock.

March, *The Month of Impatience:* When your seed order arrives, divide it into groups: (1) for the professional who grows for you to be delivered to him not later than March 10 ( ); (2) for starting in sunny window or cold frame on March 15 ( ) slow stuff, like Petunia, Verbena, dwarf hybrid Dahlia—or, if you have adequate facilities for transplanting, you can start these on March 1 ( ); (3) for starting inside house or in cold frame on April 1 ( ) such fast germinators as Sweet Alyssum, Marigold, Zinnia, Cosmos; (4) for starting outdoors on May 1 ( ). Snap a rubber band around each group of packets and mark starting date of each group. Don't be too anxious to start inside seeding. Better wait until April, unless you have plenty of space. Most annuals bloom within 60 to 90 days from seed; and August-September color is mainly what you're after.

Have cold frames under way by March 15 ( ). Plant Sweet Peas outdoors as soon as soil can be worked, perhaps March 15 ( ) in deep, rich, well-drained beds in an open situation, preferably prepared last fall. At the same time plant dormant Roses, cutting back to two eyes. Don't miss the International Flower Show in New York City in mid-March, if you can help it. This is one of the great shows of the world.

By the time Crocuses are in bloom on March 17 ( ) begin removing winter mulch. Look under the covering. As growing shoots appear, take off the mulch from that section of bed or border.

Geraniums are tall and leggy now. Try rooting a few cuttings from them indoors. They usually strike quickly and form strong young plants for summer flowering.

Be-Kind-to-the-Lawn Week starts about March 27 ( ), as the grass begins to show green. Sow grass seed if needed—2 to 3 pounds per 1,000 square feet for old lawns—and feed with 10-6-4 by means of mechanical spreader. Roll when soil is dry enough. Spring feeding, rolling and reseeding should be finished by March 31 ( ). For patching small bare places, mostly where good grass has been killed out by Crab grass, use Gardex Roller-Rake: scratch with rake side; scatter seed; rake over; reverse tool and roll with roller side.

If not attended to before, order Roses, perennial stock, deciduous shrubs, trees, evergreens. From March 15 ( ) to April 15 ( ) is a good time to set them out. Order Chrysanthemums; they will probably reach you about April 20 ( ).

April, *The Month of Fever:* Start by April 1 ( ) the rest of your indoor or cold frame annuals, Group 3. About April 5 ( ) as new growth starts, shear Yew, Hemlock, Arborvitae.

Continue to remove, bit by bit, winter mulch, as shoots underneath break through earth. Practically all should be off by April 10 ( ), when your perennials probably will arrive from the nursery. If the mulch is organic, you can dig it into the bed. Never leave it on until new shoots turn yellow and soft. Clean up border. Spray new shoots and soil with a fungicide: Bordeaux Mixture or Funtrogen, perhaps.

Perennials can be divided and transplanted as shoots break through ground. The smaller the top growth—provided there is some—the greater the chances for success. Most spring failures with perennials come from transplanting too late. Move plants when soil is crumbly, not soggy; and make use of opportunity to add humus to soil. Plant nursery stock as soon as delivered. If this is impossible, heel-in—that is, plant at an angle in a trench for temporary purposes—until time is available. Perennials do not take kindly to heeling-in, although semi-dormant deciduous shrubs and trees can be heeled-in safely for a week or more. Water heeled-in material every other day. Plant evergreens as soon as received.

Watch ventilation in cold frames. Avoid crowding seedlings. By April 10 (   ) you will need to thin out, pot, or transplant to flats, 2 inches apart each way, many seedlings.

Watch outdoors for signs of cutworms from April 15 (   ) to June 10 (   ). Spread poisoned mash or Snarol, if needed.

Before young plants can be set outdoors, they must be hardened-off—that is, gradually exposed to more light and air to accustom them to outdoor conditions. The process usually takes a week or ten days, so start it about April 20 ( ).

When mulch is off and soil workable, certainly no later than April 25 ( ), give beds and borders spring tonic. Along with a dressing of organic material, such as Driconure, scatter 5-8-7 or Vigoro—4 pounds to 100 square feet—avoiding contact with stalks and foliage. Cultivate this dressing into top few inches. Fork over to depth of 12 inches, areas to be planted to annuals, digging in humus and plant food.

From April 30 ( ) to July 1 ( ) Gladiolus corms may be set out. Prune back Roses as buds begin to swell: Hybrid Teas to two eyes; Hybrid Perpetuals to three eyes. Do not prune Climbing Roses at this time, except to cut out dead wood. Do not cut bulb foliage.

May, *The Month of Frenzy:* With the appearance of the First Aphis, usually on Roses or Spirea about May 1 ( ), spraying routine begins in earnest. Since Bordeaux Mixture disfigures appearance, many good gardeners substitute Funtrogen the rest of the season.

Clean, patch leaks, paint and restock Lily pool.

Start remaining annuals, chiefly for trial and cutting, outdoors on May 1 ( ). When Grape buds break, it is safe to sow practically any seeds outdoors, even the tenderest. Bedding material, including potted annuals, is available from nurseries on May 10 ( ). Set out all your annuals large enough to move, and plant window and terrace boxes. All annuals should be in place in the permanent garden by May 15 ( ). Try to pick cloudy days for transplanting, or do work in late afternoon. Pinch back seedlings to make stocky plants. Shade with berry boxes for several days, if young plants begin to wilt. Set out Dahlia roots from May 10 ( ) to June 10 ( ).

Routine lawn mowing starts in early May, as soon as Bluegrass reaches height of from 2 to 3 inches. Set mower to cut 1½ inches above ground. Dig out perennial weeds. Fill holes with mixture of topsoil and grass seed. Feed lawn again on May 20 ( ) with 10-6-4 or screened barnyard manure and peat moss. Rub in with back of rake, or water in, after distributing with mechanical spreader. Dry spell usually arrives between May 15 (   ) and June 1 (   ), so get hose and sprinklers organized for routine action. Never water lightly. Soak, if you water at all.

Cut off fading flowers on perennials and shrubs. Never let them set seed, unless you need the seed for a special purpose. The process depletes soil and exhausts the plant. About May 20 (   ) pinch back Chrysanthemums to prevent legginess. Do this several more times between this date and July 20 (   ).

About May 25 (   ) prepare a special seed bed for perennials, if you wish to raise some from seed. Perennials sown in late May and June make good stocky plants—better than August sown ones—and can be moved into permanent position in September.

Not later than May 30 (   ) clip deciduous hedges for first time.

June, *The Month of Plenty:* This month produces flowers galore. But weeds are active; bugs are on the rampage; grass must be cut often; and preparation must be made for the heat to come.

Potted annuals may be set out up to June 15 ( ), but annuals planted direct from flats have a hard time getting established as late as this. Started plants of Tuberous-rooted Begonias may be set out in rich, shady spot from June 1 ( ) to July 1 ( ). Cultivate beds and borders after rain to conserve moisture and to banish weeds. To save exertion, treat weeds in walks and driveways with a commercial liquid or dust weed-killer, such as Atlacide. Follow the manufacturer's directions in applying.

Tropical Water Lilies can be planted in outdoor pools any time after June 1 ( ) but not before. If necessary, algae (green scum) may be disposed of with potassium permanganate —enough to turn the water in the pool light pink.

Spray regularly with pyrethrum, rotenone or other good insecticide. Look out for rose-chafers on Roses, Grapes, Regel's Privet about June 10 ( ). These must be hand-picked; that is, thumped off into a container of kerosene.

About June 20 ( ), when foliage is brown and flexible, hardy bulbs may be dug and reset, with the exception of Tulips. If Tulips are taken up now, they are best stored in pots of soil turned on their sides until curing is completed. They may then be cleaned, sorted, stored in a dry, airy place until replanted in November. Narcissus can be separated now. It is a good way to increase stock. But replant immediately and do not pull off foliage. Let the leaves lie on the ground beside the replanted bulb, until ripening is finished. Narcissus may be moved from the time the foliage browns until September—a clump at a time, if you want to spread the work. Most perennials that have finished flowering may be divided and replanted now or in September. Cut back tops; water carefully; shade if wilting starts.

About June 25 (   ) dress border with some organic compound, such as Driconure or spent mushroom soil, and work lightly into top few inches. Stake tall perennials. Give water plentifully when grass or plants need it. Soak once or twice a week, depending upon rainfall.

Pinch out Chrysanthemums once more.

July, *The Month of Flagging Spirit:* Spring enthusiasm has evaporated. But annuals are coming into bloom; Water Lilies improve daily; and there's work to be done.

As foliage begins to brown about July 4 ( ) Bearded Iris may be divided and reset. This may continue until September. Kill borers, if you find any. Cut out rot-infested places —rot follows the borer—dust cuts with finely divided sulphur; cut leaves back one third; replant only firm, healthy rhizomes: Bearded Iris level with the soil, Siberian and Japanese Iris 3 to 4 inches deep. Japanese may be shifted after bloom is over, perhaps July 30 ( ), but it takes more kindly to moving just as spring growth starts.

Around July 10 ( ) feed Roses and annuals. Pay attention to mulching and watering. Be sure lawn mower is set to cut high, 1½ inches above soil line. Spray for mildew at first sign with sulphur or Funtrogen. Deciduous hedges need clipping again. Attend to staking. Pinch out Chrysanthemums on July 20 ( ) for last time.

Finish pruning spring-flowering shrubs, Climbing Roses, Wisteria by July 30 ( ). Cut blossoms and old wood from spring-flowering shrubs; merely control Large-flowered Climbing Roses for they flower best on old wood, but remove old wood and save new shoots of Bunch-flowered Climbers; cut laterals of Wisteria back to spurs.

August, *The Month of Perennial Famine:* After the Hollyhocks have bloomed a lull in perennials sets in. But annuals are blazing, Tropical Water Lilies are at their best, and by August 15 ( ) dews will begin to be heavy and nights will grow cooler. Just now early-morning, before-breakfast garden work is agreeable. Flowers for the house should be cut then, or in the late evening, when they're turgid.

Seed of hybrid Delphinium from specialists is available about August 1 ( ). Annuals to be potted and brought into the house for winter flowering may be sown now. Also, many types of hardy Primula are easily grown from seed collected from your own plants. Sow these in flats of commercial humus; transplant to pots when large enough to handle; be prepared to carry them through winter in cold frame or house.

About August 5 ( ) at time of second growth, shear lightly short-leaved conifers. With earth ball, conifers may be moved during this growth period. Water carefully and mulch.

On August 10 ( ) make a special bed for biennials or for growing as biennials Pansies, Rust-resistant Snapdragons, English Daisies, Hollyhocks (in heavy soil)—one of the best ways of handling these plants. Transplant when large enough, about September 10 ( ) to temporary bed, setting 4 inches apart each way. Mulch after ground freezes. Put into permanent garden in early spring.

Around August 15 ( ) Oriental Poppies, Leopard's-banes, Bleeding Hearts, Mertensias are dormant and may be moved. Order Madonna Lilies now and plant them, shallow and in full sun, as soon as they arrive. Get that bulb order into the mail. Keep annuals and perennials from seeding. Feed annuals again, but do not feed perennials again after August 15 ( ) so that they may ripen properly against the coming winter.

Convert a cold frame into a propagating frame about August 20 ( ) by shading with laths. Increase your stock of shrubs and perennials by rooting cuttings of half-ripened wood in wet sand and peat moss.

Make a critical examination of the border about

August 25 ( ). Determine changes and make written notes on moves to be made during September.

If necessary, soil may be treated on August 25 ( ) or thereabouts with lead arsenate—8 pounds mixed with bucket of soil per 1,000 square feet of lawn—to destroy grubs of Japanese and June beetles, which feed on grass roots.

September, *The Month of Second Wind:* Both the garden and the gardener now take a new lease on life. Excellence of spring picture to a large extent depends upon fall work. Don't neglect it.

New lawns may be made between August 20 ( ) and September 20 ( ), or old ones repaired. New lawns may also be made in spring, between March 20 ( ) and April 10 ( ); but the weather is uncomfortable then and spring lawn making often fails through too long delay. Ideal times for lawn making are usually the first fifteen days of September.

Established lawns should have bare spots or thin spots reseeded and be dressed with Driconure, spent mushroom soil, or other organic compound low in nitrogen about September 15 ( ).

On September 15 ( ) clip deciduous hedges for last time.

Perennials which have bloomed may be moved and divided any time during September. Material blooming in September-October should be moved in spring. Follow the notes you've made during the year and especially those taken when you made your critical inspection in late August, and redesign the border.

Plant bulbs as received from dealers, though Tulips may be delayed until after Election Day ( ). Narcissus should not be planted later than September.

October, *The Month of Flame:* Many people think of this month as marking the death of the year. Gardeners know better. It is the beginning of spring rebirth, when the garden will rise phenix-like from the ashes of autumn.

Collect leaves for compost pit. Do not burn them, unless they're diseased.

Bring potted plants into the house by October 1 ( ). Dig Gladioli and Dahlias when cold changes the color of their tops, about October 10 ( ). At the same time, pot up bulbs for later forcing in the house. Store them in cool, dark place—such as root cellar or covered cold frame—to encourage root formation.

Deciduous shrubs may be moved when the leaves change color, about October 15 ( ); but trees are better moved when all their leaves are off.

Oil and put away lawn mover about October 20 ( ) when grass growth slows down. Plant Lily bulbs as they're received. Mulch places for others yet to come; and prepare and mulch heavily spot for living Christmas Tree, if you plan to have one. Mulch evergreens with 2 to 3 inches of oak leaves, peat moss or leafmold.

Fork over, do not rake but cover with cow manure or Driconure, annual or other unplanted beds. Frost action will greatly improve soil condition by spring.

November, *The Month of Cooling Embers:* The fires of autumn are nearly spent. Do not try to hurry them. Nature has been at this job a long, long time.

Remove diseased stalks or leaves and burn them.

But do not cultivate or clip things close to crowns or clean up borders in an excess of housewifely zeal. Most hardy plants protect themselves perfectly by their own ripened leaves. You may cut off tall perennial stalks about 12 inches above the ground and use them for covering. Begin to cover tender material when night temperatures reach 20 degrees, about November 25 (   ). When ground has frozen one inch, cover all questionable material.

December, *The Month of Memories:* Except for occasional inspection trips, occasional visits to the cold frame to bring in potted bulbs, occasional brief sessions with a snow shovel, outdoor work for the year is over.

Gardening is now at the contemplative, fireside stage. Opportunity is at hand to read those garden books you bought last spring and couldn't find time to finish. Make up your Christmas list for garden-minded friends; try your hand at flower arrangements; clean and sharpen and oil your tools. Read Fairchild's *The World Was My Garden,* though it may take all winter.

Those hibernating borders soon will awake. Soon the voice of spring, echoing in your heart, will rouse them. Before your nap is done, another year will be upon you. Rest while you may. Rest and dream of good gardens gone, and better ones yet to come.

INDEX

Scientific plant names used in this book, except in the case of a few horticultural trade names, conform to Professor L. H. Bailey's STANDARD CYCLOPEDIA OF HORTICULTURE. *For the practical gardener's added advantage, both common and botanical names of plants are indexed as well as the subject matter treated upon; and puzzling gardening terms are defined.*

INDEX AND GLOSSARY

Abelia grandiflora, 152
Abies, 275
Accent, border, 134, 165
  garden, 24, 25
Access, ease of garden, 23
Accessories and tools, list of, 307-311
Acer circinatum, 153
  ginnala, 153
  japonicum, 152
  palmatum, 152
  platanoides, 49
  saccharinum, 50
Acid bed, how to make, 93
Acid soil, 91
Acidifying agents, 92
Acid-soil and shade-tolerant plants, 272 *et seq.*
Aconitum, 200
  Sparks' Variety, 200
Adco, 99
Advance planning, benefits of, 8, 9, 10, 19, 137
Adder's-tongue, common, 266
Aerate: To expose to action of the air, as in ploughing or forking.
Agapanthus, 257
Agapanthus umbellatus, 200
  umbellatus var. *Mooreanus,* 200
Ageratum, 241
  hardy, 209
Agrostis (Bentgrasses), 107, 117
Ailanthus tree, 51
Ailanthus altissima, 51
Ajuga, 123
Ajuga genevensis, 123
  reptans, 121
  reptans var. *rubra,* 123
Algae, correction of, 295
Alkaline soil, 91
Alkanet, 201
Allium, garden, 200
Allium albopilosum, 200
  Schoenoprasum, 200
Alpines: Plants thriving under imitated mountain conditions; rock garden plants.
Althaea rosea, 212
Aluminum sulphate, 92, 93
Alyssum, hardy, 182, 200
  Sweet, 241
Alyssum maritimum, 241
  saxatile var. *Citrinum,* 201
Amelanchier canadensis, 153
American Delphinium Society, 206
American Elm, 52
American Holly, 285
American Laurel, 283
American Peony Society, 195

Ampelopsis heterophylla var. *amurensis*, 224
Amsonia (Ansonia), 201
Amsonia Tabernaemontana, 201
Anacharis, 295
Anchusa, 182, 201
Anchusa italica, 201
  italica var. Dropmore, 201
  myosotidiflora, 201
Andromeda, Japanese, 286
Andromeda, Mountain, 286
Anemone japonica, 201
  var. September Charm, 201
Annual: Of one season's duration.
Annuals, Chapter on, 230
  adapted to mixed borders, color list of, 241, 242
  advantages of professionally grown, 236
  burden of raising many, 231
  cost of potted, 240
  good points of beds containing only, 238
  home testing of, 237
  modern bedding with, 239, 240
  need for, 231
  practical ways of acquiring, 235
  soil preparation for, 94, 328
  typical routine for indoors start with, 233, 234
Anthemis tinctoria, 201
  tinctoria var. Moonlight, 202
Anther: The pollen-bearing part of the stamen.
Anthericum Liliago, 202
  Liliago var. *major*, 202
Antirrhinum, 242
Aphis, *pl.*, Aphides: Plant lice.
Apple, McIntosh, 61, 62
  Wealthy, 62
Aquilegia, 182, 202
  Dobbie's Imperial, 202
  Wayside Giant, 202
Aquilegia chrysantha, 202
  chrysantha var. *alba-plena*, 189
  flabellata var. *nana-alba*, 167
Arabis alpina var. *flore-pleno*, 167
Arborvitae, 148, 149
Arbutus bush, 152
Area, Entrance, 35
  Garden or Private, 36
  Service, 35, 36
  Trial and Propagation, 34
Armeria, 202
  Wayside Tall Hybrid, 202
Aronia, 153
Aronia arbutifolia, 153
Arrow-wood, 163
Arsenate of lead, 314
Art, attitude toward landscape, 11, 12
Artemisia, 202
  var. Silver King, 203
Artemisia Abrotanum, 203
Artificial irrigation: Application of water to plants by any means other than rainfall.
Aruncus sylvester, 203
Asclepias tuberosa, 203
Ash, Mountain, 164
Asiatic Elm, 53
Aster, China, 241
Aster, hardy, 197
  dwarf hybrid, 167, 197
  Frikarti, Wonder of Staffa, 197
  list of outstanding species and varieties of, 197
  tall hybrid, 197
Aster alpinus, 197
  subcaeruleus, 209

Astilbe (Spiraea), 203
  var. Granat, 203
Atkins & Durbrow, 85
Atlacide, 331
A Year in My Garden, 318
Axis, garden: An imaginary line connecting a suitable point at the house with a point of interest in the garden.
Azalea, 46, 153 (See *Rhododendron*).
  evergreen, 281, 282, 284
  Flame, 154
  Ghent hybrid, 153
  hardy deciduous, 153, 165
  Mollis, 153

Babcock, Mrs. Huntington, 22
Baby's-breath, 210
Background, hedges for, 146-150
  masonry, 144
  shrubs and flowering trees for, 150-164
  wooden, 145
Bad taste, 12
Bailey, Professor L. H., 2, 82, 317, 341
Balance, formal, 24
  informal, 24, 48
Balled and burlapped (B&B): Dug with an earth ball which is wrapped in burlap to protect roots and increase probability of success in transplanting.
Balloonflower, 218
Baltic Ivy, 126
Baptisia australis, 203
Barberry, 149
  Mentor, 165
Barron, Leonard, 318
Base planting, 35, 279-282
Basic design, function of, 9, 22
Basket of Gold, 200
Bayberry, 161
Beach Plum, 162
Beardtongue, 217
Beautybush, 159
Bedding: Temporary outdoor use of plants, massed for effect.
Bee Balm, 216
Beetles, soil treatment for control of, 336
Begonia, hardy, 203
  tuberous-rooted, 46, 203, 257, 281
Begonia Evansiana, 203
  tuberhybrida, 203
Belamcanda chinensis, 204
Bellflowers, 204
Bellis perennis, 204
Bentgrass (*Agrostis*), 107
Bentgrasses, requirements of, 117-120
Benzoin aestivale, 154
Berberis, 285
Berberis Mentorensis, 150, 285
  Thunbergi pluriflora erecta, 150
  verruculosa, 285
Bergamot, 216
Betony, 221
Better Homes & Gardens, 317
Betula, 59
Biddle, Dorothy, 317, 321
Biennial: Of two seasons' duration.
Biennials, few useful, 135, 182
Birch, 59
Bird food, natural, 163
Black Haw, 163
Black Locust, 57
Black Oak, 54

Blackberry Lily, 204
Black-eyed Susan, 220
Blanchan, Neltje, 22
Blanket Flower, 210
Blazing Star, 214
Bleeding Heart, 123, 207
  fringed, 266
Blight: Parasitic disease.
Bluebells, Virginia, 215
Blueberries, 165
Blue Bonnet, 221
Blue Dragonhead, 208
Bluegrass (*Poa*), 104, 107
Bluegrasses, requirements of, 117-120
Blue Lily of the Nile, 200
Blue Salvia, 220
Blue Spirea, 204
Blue Spruce, 67
Bonemeal, 86
  lime in, 92
Books and magazines, 316-318
Borage, Italian, 201
Bordeaux Mixture, 314
Border: A marginal planting, usually a long strip.
Border, Chapter on the Flower, 129
  advantages of the mixed flower, 130
  avoidance of rows in the, 139, 140
  how to plan the, 137-143; *illus.*, 141
  importance of background for the, 143, 144
  individual expression in the, 142, 143
  location of the, 140
  opportunities for bulbs in the, 267-269
Border—(*Continued*)
  planning strips for the, 138, 139
  seasonal bloom in the, 142
  the best, 134
  the five main perennial types for the, 140-142
  typical position of perennial groups in the, 135
  unusual specimen shrubs and trees for the, 165
  use of annuals in the, 131-134, 136, 137
  width of the, 138
Border soil, ideal, 77
Borer: Common name for many types of insects which tunnel into plant tissue.
Botanical names, explanation of, 188-191
Botany: The science which treats of plants.
Bottom heat: To cause the roots of plants to be warmer than their tops.
Boundaries, garden, 24
Bowen, Isabella Pendleton, 22
Boxwood, 147, 165, 278
  dwarf, 147, 166
  Korean, 166
  tree, 148
Boyce-Thompson Institute for Plant Research, 185
Bract: Those leaves directly associated with a flower.
Brand Peony Farms, 196
Break: Said of buds starting into growth.
Bridalwreath, 151
Bristol Nurseries, 198
Brunnera macrophylla, 201

Buckthorn, 150
Buddleia, 154
  var. Charming, 154, 165
  var. Fortune, 154, 165
  var. Ile de France, 154
Buddleia Davidii, 154
Bud mutation: Variation from type arising from a bud.
Bugle, 126
Bugleweed, 121, 123
Building lot, level, 21
  rolling, 21
Bulb: A thick or scaly underground bud which usually develops roots from the base.
Bulbs, Chapter on, 244
  association of ground covers and, 267
  Lily, 260-265
  minor, 255-257
  Narcissus, the most agreeable of, 244-252
  naturalizing, 265-267
  opportunities in the border for, 267-269
  summer flowering, 257-260
  Tulip, Hyacinth and Crocus, 253-255
Burlap: Coarse cloth used in covering and protecting plants.
Burn: Said of plant tissue injured by chemical action, frequently resulting from free ammonia in fertilizer.
Bush honeysuckle, 160
Butterfly Bush, 154
Butterfly Weed, 203
Buxus sempervirens, 148
  sempervirens var. *suffruticosa,* 147, 166
  microphylla, 166
Cabomba, 295
Caladium, 67, 68
Calcium, 75
Calendar, garden, 319
  real value of, 321
  January, *The Month of Catalogs,* 321
  February, *The Month of Planning,* 322
  March, *The Month of Impatience,* 324
  April, *The Month of Fever,* 326
  May, *The Month of Frenzy,* 328
  June, *The Month of Plenty,* 330
  July, *The Month of Flagging Spirit,* 332
  August, *The Month of Perennial Famine,* 334
  September, *The Month of Second Wind,* 336
  October, *The Month of Flame,* 337
  November, *The Month of Cooling Embers,* 338
  December, *The Month of Memories,* 339
Callistephus chinensis, 241
Calluna, 285
Calluna vulgaris, 285
Calycanthus floridus, 154
Camassia, 256, 267
Camassia esculenta, 281
Campanula, 204
Campanula carpatica, 167, 182, 204
  Medium, 204
  Medium var. *calycanthema,* 204

Campanula—(*Continued*)
  persicifolia var. Telham Beauty, 204
  pyramidalis, 204
  pyramidalis var. *alba,* 204
Candytuft, hardy, 134
Canterbury Bells, 204
  Cup-and-Saucer, 204
Cape Hyacinth, 257
Cape Marigold, 241
Capek, Karel, 318
Capitate: Gathered into a head.
Carbon dioxide, 75
Carnation, hardy, Crimson King, 207
Carolina Poplar, 50
Carpinus Betulus var. *fastigiata,* 56
Caryopteris incana, 204
Cassia marylandica, 205
Catananche caerulea, 205
Catmint, 216
Celtis mississippiensis, 54
  occidentalis, 53
Centaurea, 182
Cerastium tomentosum, 182
Ceratostigma plumbaginoides, 123, 205
Cercis canadensis, 155
Chaenomeles japonica, 155
Chamaecyparis obtusa var. *gracilis,* 148
  pisifera var. *plumosa,* 148
Chamomile, 201
Change, most significant garden, 45
Character, intrinsic plant, 63
  architectural garden, 64
Chaste Tree, 223
Cherries, flowering, 161
  native, 164
Chestnut, native, 53
Chewing insects, 313
China Aster, 241
Chinaberry tree, 52
Chinese Azalea, 153
Chinese Bellflower, 218
Chinese Elm, 53
Chinese Lantern, 218
Chionanthus virginica, 155
Chionodoxas, 256
Chives, 200
Chokeberry, Red, 153
Christmas Berry, 161
Christmas tree, living, 338
Chrysanthemum, hardy, 197, 198
  Korean hybrid, 135, 198, 199
  list of outstanding species and varieties of, 197-199
Chrysanthemum coccineum, 198
  lacustre, 198
Chrysanthemum Leucanthemum var. White Swan, 198
  maximum, 198
Cladrastis lutea, 61
Clay soil, add to, 86
  peculiarity of, 96
Clematis, shrubby, 205
Clematis heracleaefolia var. *Davidiana,* 205
Clematis, large-flowered hybrid, 225, 226, 227
  var. Duchess of Albany, 227
Clemson mower, 116
Clethra alnifolia, 155
Climbers, 225
Climbing Hydrangea, 225
Clover, 118
Colchicum, 256
Cold frame. See Frame.
Color and Succession of Bloom in the Flower Border, 168

Color, questions of, 167
  cold, 170
  don't be afraid of, 173
  improving perception of, 168
  individual reaction to, 168
  personal preferences in, 169, 170
  variability of garden, 168
  warm, 170
Colour in the Flower Garden, 42
Color wheel, suggestive value of, 170, 171; *illus.,* 172
Columbine, 135, 202
Columnberry, 150
Commercial humus: Leafmold sold by the bag.
Compost: A mixture of decayed vegetative refuse, soil and chemicals, valuable in soil improvement.
Compost heap, how to make a, 98, 99
Compound leaf: A leaf with two or more separate leaflets.
Coneflower, 220
Conifer: Cone-bearer.
Connell, Clarence, 13
Convallaria majalis, 206
Copper Lustre (Iris var.), 187
Coral-bells, 212
Cordon: Tree or woody plant trained to low horizontal arms.
Coreopsis, 169, 182
Corm: A solid bulb-like part, usually underground.
Cornelian Cherry, 156
Cornus alba, 156
  alternifolia, 156
  canadensis, 156
  florida, 60
  florida var. *rubra,* 61
Cornus—(Continued)
  Kousa, 61
  mas, 156
  Nuttallii, 61
  racemosa, 156
  stolonifera, 156
Cosmos, 242
Cost, average garden, 17, 18
  average soil conditioning, 83
  garden maintenance, 18, 19
  lawn making, 112
  specific example of garden, 18, 19
Cotinus Coggygria, 156
Cotoneaster, 285
Cotoneaster divaricata, 285
  microphylla, 285
Cottonwood, 50
Cotyledon: Primary leaf or leaves in the plant embryo; seed-leaf.
Crabapple, flowering, 160
  Arnold's, 161
  Bechtel's, 161
  Carmine, 161
  Parkman's, 161
  Scheidecker's, 161
Crab grass, 110
Crane's-bill, 210
Crape Myrtle, 159
Crataegus Crus-galli, 150
Creeping Bent lawns, 117-120
Crocus, 253, 254, 255, 256, 266
Crocus, autumn-flowering, 256
Crocus Imperati, 256
  Korolkowii, 255
  Sieberi, 256
  zonatus, 256
Cross-axis: An imaginary line cutting at right angles the main garden axis.

Crown: That part of a plant where stem and root meet; also, the center of a flower.
Crown Imperial (*Fritillaria Imperialis*), 67, 68
Cultivate, when to, 95
Cultivation: The stirring and aeration of the top few inches of soil.
Cumming, Jr., Alex, 198
Cutting: A piece of a plant, more frequently a part of a stem, which under proper conditions will reproduce the parent plant.
Cypress, 148, 149
  Plumed, 148
  Slender Hinoki, 148
Cytisus scoparius, 156

Daffodil (*Narcissus*), 245
Dahlia, 259
  Coltness hybrid, 257
  culture of, 259, 260
Daisy, true, 204
  English, 204
  field, 198
  Michaelmas, 197
  Painted, 198
  Shasta, 198
Dame's Violet, 211
Daphne, early, 157
Daphne Cneorum, 166, 171
  Mezereum, 157
Day-lily, 135, 211
Deciduous: Non-evergreen; more literally, falling.
Deciduous flowering shrubs and trees, list of, 152-164
Deciduous trees, garden merits of, 49-59
Delphinium grandiflorum var. *chinense,* 206
Delphiniums, 135, 182, 206
  Belladonna, 206
  Blackmore & Langdon, 206
  Duckham, 206
  Hood, 206
  var. Pink Sensation, 206
  Steichen, 206
  Sutton, 206
  Vetterle & Reinelt, 207
  Wayside, 206
Dempsey, Professor Paul W., 318
Design, common characteristics of good garden, 20-27
  formal, 21, 24
  informal, 21, 24
Desmodium, 214
Detail, errors in plant, 65
Deutzia, 157
Deutzia gracilis, 157
  Lemoinei, 157
  scabra, 157
Dianthus, 182, 207
Dianthus barbatus, 207
  Caryophyllus, 207
  latifolius var. Beatrice, 207
  plumarius, 177
  plumarius var. Essex Witch, 167
  plumarius var. White Reserve, 167, 207
Dibble (Dibber): A sharp-pointed tool for making a hole in soil.
Dicentra, 207
Dicentra eximia, 167, 207
  spectabilis, 207
Dictamnus albus, 177, 208
  albus var. *caucasicus,* 208

Dig, justification of desire to, 72
  when to, 94, 95
Digitalis, 182
Dimorphotheca pluvialis ringens, 241
Dioecious: Male and female flowers on different plants.
Diseases and Insects, control of, 312-316
Dissatisfaction, avoidance of, 9
Dockmackie, 163
Dogwood, shrub, 156
Dogwood tree, 60, 165, 280
  special landscape value of, 60
Dooryard garden, 35, 45
Dormancy: Period of inactivity, generally indicated by loss of foliage.
Doronicum, 208
Doronicum caucasicum, 208
Double flower: One having more than the usual number of petals.
Double-digging: Method of spading by which deep soil preparation is accomplished.
Double-digging, 86-89; *illus.,* 88
Douglas Fir, 277
Downing, Andrew Jackson, 41
Dracocephalum, 208
Dracocephalum Ruyschiana var. *japonicum,* 208
Drainage. See Under-drainage.
Drainage materials, 79, 84
Driconure, 85
Dry well: A type of underground drain.
Dust mulch, 79
Dusting. See Insects and Diseases, 312
Dutch Elm disease, 52
Dwarf: A plant which never attains the size of representative, or standard, individuals in the species. Dwarfing may be natural or induced.
Dwarf Alder, 158

Earth ball: Soil immediately surrounding roots which is removed with them when transplanting.
Echinacea purpurea var. *serotina,* 220
Echinops Ritro, 182, 208
  Ritro var. *tenuifolius,* 208
Edging, concept of border, 165, 166
  list of plants especially adapted to, 166, 167
Elaeagnus angustifolia, 157
  multiflora (longipes), 157
Elderberry, 164
Elephant Ears, 68
Eleusine indica, 110
Elliott, Frank, 231
Elm, American, 52
  Asiatic (Siberian), 53
  Chinese, 53
Enkianthus campanulatus, 157
  cernuus, 158
  cernuus var. *rubens,* 158
Entrance Area, 35
Epicurus, 12
Equipment, garden, 305
Erica, 285
Ericaceous group, 81
Erigeron, 208
Erigeron aurantiacus, 209
  speciosus, 209
Errors, principal causes of plant detail, 65, 66
  crowding, 66, 67

Errors—(*Continued*)
  scale, 66
  taste, 67, 68
Eryngium, 209
Eryngium amethystinum, 209
Erythronium, 256
Erythronium americanum, 266
Escape: Said of garden plants which establish themselves outside of cultivated areas.
Espalier: A trellis; but more often a woody plant or tree trained on a trellis into a fan or U shape, usually in a vertical plane.
Established plant: One which is permanently settled.
Euonymus, spreading, 286
Eupatorium, 209
Eupatorium coelestinum, 209
  purpureum, 209
European Hornbeam, 56
Evening Primrose, 216
Evergreens, Chapter on, 271
  Broad-leaved, 272
  Coniferous, 272
  home nursery for, 275, 276
  how to prune, 276-279
  how to transplant small, 273, 274
  interesting list of chiefly broad-leaved, 283-287
  value in shade of, 282, 283
  when to move, 275
  year-around effectiveness of, 279-282
Evonymus patens, 286
Expense, gardening, 18
Experiment stations: Every state in the Union has one or more agricultural experiment stations, supported by public funds and engaged in valuable horticultural research.
Exposure, influence upon garden character of, 46

Fairchild, David, 339
Fallow: Plowed or tilled and left unseeded.
False Dragonhead, 135, 218
False Indigo, 203
Fantasy Zinnias, 242
Fastigiate: Having branches erect and close together.
Father Hugo's rose, 125
Feed plants, when to, 96, 97
Fertile soil: Productive soil.
Fertility, maintenance of soil, 94-98
Fertilization in the flower: Fusion of sexually differentiated cells, resulting in formation of seed.
Findlay, Professor Hugh, 168
Fine art, garden as, 43, 64
Fir (*Abies*), 275
Fir, Douglas (*Pseudotsuga*), 277
Firethorn, Laland's, 165, 281
Firm: To make firm; to press down the soil around small plants.
Flat: A shallow, topless box in which seeds are sown and small plants handled.
Flax, 214
Fleabane, 208
Flocculation: The act or process of becoming granular.
Floriculture: The growing of plants for flowers alone.
Florida Humus, 92
Floriferous: Flower-bearing.

Flower bed, ideal, 79, 81; *illus.*, 80
  practical example of construction of, 82-84
Flowering cherries, 161
Flowering crabapple, 160, 165
Flowering Tobacco (*Nicotiana*), 239
Flowering trees: Decorative trees usually more valued for blossom than for fruit.
Flowering trees and shrubs, list of deciduous, 152-164
Flowers, landscape function of, 14
Forcing: Growing of plants outside of normal season.
Forms, principal garden, 25
Formula, for grass, 78
  for flowers or vegetables, 78
Formulae, explanation of fertilizer, 75
Forsythia, 146, 150
Fothergilla major, 158
Foundation planting, typical problem in, 279-282
Frame: A box without permanent top or bottom, usually covered with glass and designed to grow plants. A standard frame is 6 by 12 feet and accommodates four sashes. Supplied with bottom heat, a frame is part of a hotbed; relying on the sun only, a frame is part of a cold frame.
Franklinia, 158, 165
Fraxinella, 177, 208
Friable: Easily crumbled.
Fringe Tree, 155
Fritillaria meleagris, 256
  recurva, 256
Fruits, stone, 161
Fuchsia, hardy, 209
Fuchsia magellanica, 209
Functional areas, 29, 34-36
Fundamental plan, difficulty of altering, 22
Fungus, 313
Funkia subcordata grandiflora, 125
Funtrogen, 329

Gaillardia, 210
  var. Ruby, 210
  var. Sun God, 210
Galanthus nivalis, 266
Garden Building-Blox, 16
Garden calendar. See Calendar, garden.
Garden design: A disposition of the parts which brings order, unity and beauty to the whole.
Garden Dictionary, 2
Garden Digest, 316
Garden equipment, Chapter on, 305
Garden or Private Area, 36
Garden plan: A diagram, similar to a floor plan, of a projected garden.
Garden plan, how to make a, 16, 37; *illus.*, 30-33
Garden Pools: Large and Small, 298
Gardenia, 321
Gardening in the Shade, 283
Gardens, start of good, 5
Gardex, Inc., 306
Garland Flower, 171
Gas Plant, 208

Gay-feather, 214

Gazebo: A lookout.

Genista tinctoria, 156

Genus: A group of species or rarely one species, a monotypic genus; a division of a plant family.

Geranium (*Pelargonium*), 210, 325

Geranium, hardy, 210

Geranium ibericum, 210

Germander, 166

Germination: Unfolding and growing of the embryo plant contained within a seed.

Geum, 210
  var. Fire Opal, 210

Ginkgo biloba, 56

Gladiolus, 258
  culture of, 258, 259

Gleditsia triacanthos, 57
  triacanthos var. *inermis,* 57

Globe Thistle, 208

Goat's Beard, 203

Goat's-rue, 210

Golden Chain, 159

Golden-rain tree, 159

Gordonia altamaha, 158

Gothein, Marie Luise, 318

Grape Hyacinth, 257

Grape, wild, 164

Grapevine, 47, 224, 225

Greek Mallow, 221

Greek Valerian, 219

Green thumbs: Talent for handling plants.

Gromwell, 214

Ground cover: Any low, massed planting which takes the place of grass.

Ground covers, list of, 122-126

Ground Pink, 125, 197

Grown on: Kept growing until needed for final use.

Guinea-hen Flower, 256

Gumi, 157

Gums, 210

Guy-wire: Heavy wire attached to newly planted specimen to steady it. Where wire might chafe bark, it is usually passed through a section of discarded garden hose.

Gymnocladus dioica, 58

Gypsophila, 210

Gypsophila, var. Rosy Veil, 211

Gypsophila paniculata, 211
  paniculata var. Bristol Fairy, 211

Hackberry, 53, 164

Halesia carolina, 158

Hamamelis, 158

Hamamelis japonica, 158
  mollis, 158
  vernalis, 158
  virginiana, 158

Hanson's Lily, 281

Hardening off: Process of adjusting indoor grown plants to outdoor conditions by gradual exposure.

Hardpan: Layer of compacted subsoil almost impervious to water.

Hard pruning: To cut back more than normally.

Hardy: Ability to withstand winter outdoors; a relative term.

Hardy Ageratum, 209

"Hardy border, father of the," 41

Hawthorn, 150, 164
  Cockspur, 150
"Hawthorn Hill," 4
Heath (*Erica*), 285
Heath family, 81
Heather (*Calluna*), 285
Heather, Scotch, 285
Heavy soil: Soil containing a large proportion of clay.
Hedera helix, 123
  helix var. *baltica* (*gracilis*), 123
Hedges: Living fences; a hedgerow is an unclipped hedge.
Hedges, 146
  care of, 149
  deciduous, 149, 150
  evergreen, 147, 148
  formal, 147
  informal, 146
  overcoming monotony in, 164, 165
Heeling-in: A method of temporary outdoor storage which consists in setting plants at an angle and close together in a trench, covering the roots with soil and watering frequently until permanent planting can be undertaken. The practice is resorted to when the gardener receives more plants than he can handle.
Helenium, 211
  var. Peregrina, 211
Helianthemum Chamaecistus, 124
  Chamaecistus var. Buttercup, 125
Heliotrope, hardy garden, 222
Hemerocallis, 211
  var. Gypsy, 211
  var. Hyperion, 211
  var. Dr. Regel, 211
  var. Mrs. W. H. Wyman, 211
  Lemon Lily (*sp.*), 211
Hemerocallis flava, 211
  fulva, 261
Hemlock, 46, 148, 278
Herb: Any plant lacking firm woody structure, or naturally dying to the ground.
Herbaceous: Soft-wooded.
Herrick, Dr. A. H., 317
Hesperis matronalis, 182, 211
Heuchera, 182, 212
Heuchera sanguinea, 212
  sanguinea var. *Rosamundi,* 212
Hibiscus Moscheutos hybrids, 221
  syriacus, 323
Hill, E. G., 190
Holly, 285
  American, 164, 165, 285
  Japanese, 165, 286
Holly Osmanthus, 286
Hollygrape, 286
Hollygrape, Oregon, 286
Hollyhocks, 135, 182, 212
  Sutton's Prince of Orange, 213
Honey Locust, 57
  thornless, 57
Honeysuckle, bush, 160
  Morrow's, 165
Honeysuckle vine, ground cover of, 126
Hormodin Powder, 185
Hornbeam, European, 56
Horsemint, 216
Horticulture: The practical art of growing plants.
Hortus, 317

Horvath hybrid roses, 220
Hosta, 125
Hosta caerulea, 167
  lancifolia, 167
  plantaginea, 125
Hotbed. See Frame.
Hottes, Alfred C., 317
Hough, Henry Beetle, 70; quotation, 71
House & Garden, 317
House Beautiful, 317
How To Arrange Flowers, 321
Humus: Vegetable mold.
Humus, when to add, 96
Hyacinths, 253, 254
  Cape, 257
  Grape, 257
  Wood, 256, 266
Hybrid: A cross, usually man-made, between unlike plants.
Hydrangea, 158
  climbing, 159, 225
  oak-leaved, 159
  Pee Gee, 152
  var. Blue Bird, 159
Hydrangea arborescens, 159
  opuloides, 159
  petiolaris, 159, 225
  quercifolia, 159
Hydrogen concentration (pH), 91
Hydroponics: Growth of plants without soil in chemical solutions.
Hymenocallis calathina, 257

Iberis sempervirens, 167, 182
Ilex, 285
Ilex crenata, 286
  crenata var. *microphylla,* 165, 286
  opaca, 164, 285
Incarvillea, 213
Incarvillea Delavayi, 213
Indian Currant, 164
Indian Quamash, 267
Inorganic: Not produced by vital processes.
Insects and Diseases, control of, 312-316
In situ: In the place where it is to remain, as in the sowing of some flower seeds.
Interest, usual awakening of home garden, 6, 7
Interior decoration, similarity of garden planning to, 10, 11, 26
International Flower Show, 116, 325
Interplanting: Planting between or among.
Improvement, average reasons for property, 7, 8
Iris, 192
  autumn-flowering, 135, 167, 193
  bearded, 135, 193
  crested, 125, 192
  Japanese, 194
  list of outstanding species and varieties of, 192-194
  Louisiana swamp species, 194
  Siberian, 192
  Vesper, 194
  var. Copper Lustre, 187
  var. Jean Siret, 167
  var. Ultra, 167
Iris borer, 192, 322
Iris cristata, 126, 192
  cristata var. *alba,* 192
  dichotoma, 182, 194
  florentina, 193
  fulva, 194
  germanica, 193

Iris—(*Continued*)
  laevigata, 194
  pallida, 193
  reticulata, 256
  sibirica, 192
  tectorum, 192
  tectorum var. *alba*, 192
Iron, 75
Ismene, 257
Italian Borage, 201
Ivy, English, 46, 123, 224
  Baltic, 126
  hardy Baltica, 123

Jacaranda tree, 52
Jacaranda ovalifolia, 52
Jacob's Ladder, 219
Japanese Andromeda, 286
  beetle, 107. See Beetles.
  Flowering Cherries, 162
  Holly, 165
  maples, 152
  Quince, 146, 150, 155
  Snowball, 163
  Spurge, 122, 281
  Windflower, 201
  Yew, 147, 275
Japonica, 155
Jekyll, Gertrude, 41, 44, 219; quotation, 42
Joe-Pye Weed, 209
Jones's Beach, 239
Jonquil (*Narcissus*), 245
Judas Tree, 155
Juniper, 279
  Irish, 165
  Pfitzer's, 165
Juniperus virginiana, 148

Kains, M. G., 318
Kalmia, 282, 283
Kalmia angustifolia, 284
  latifolia, 282, 283
Kelsey Nursery Service, 60
Kentucky Blue Grass, 104, 107
Kentucky Coffee Tree, 58
Kirkland, Dr. James Hampton, 187
Kniphofia, 213
  var. Goldmine, 213
  var. *Pfitzeri*, 213
  var. Towers of Gold, 213
Knock out: To remove a potted plant by inverting the pot and knocking its rim against some hard object, such as a potting bench.
Koelreuteria paniculata, 159
Kolkwitzia amabilis, 159

Labels: Devices for preserving plant names for display or for the gardener's information.
Laburnum, 159
  var. *Vossi*, 159, 165
Lagerstroemia indica, 159, 188
Lambkill, 284
Landscape architect, 14
Landscape horticulture: The growing of plants for landscape or garden purposes.
Landscaping: Development in any area, large or small, of view or design by garden forms, methods and materials.
Landscaping the Home Grounds, 27
Lang, Andrew, 318
Lantana, 242
Larch, 272
Larkspur, hardy, 206

Laterals: Side shoots.
Lattice, 146
Laurel, 46, 283
  Mountain, 277, 281, 282, 283
  Sheep, 284
Lavender, true, 213
  dwarf, 167, 213
Lavandula, 213
Lavandula vera, 213
  vera var. *compacta* (*nana*), 167, 213
Lawns, Chapter on, 103
  best time for making, 108
  control of weeds in, 108, 109, 110
  cost of making, 112
  creeping Bent, 117-120
  detailed comparison between Bent and Bluegrass, 117-120
  feeding, 114
  ground covers in place of, 122
  height to cut, 115, 116
  landscape function of, 103
  main reasons for difficulties with, 104
  maintenance of, 112-117
  making a new, 107-110
  mowing, 115, 116
  remaking an old, 110-112
  shady, 121
  soil analysis for, 107
  specific example of restoration of, 111, 112
  ten rules for planting and care of, 105, 106
  watering established, 117
  watering newly seeded, 109
Lawrence, C. H., 298
Leach out: To drain away.
Lead arsenate, 314
Leader: Leading shoot; terminal of a trunk.
Leggy: Said of a plant which develops too much stem; not stocky.
Leiophyllum buxifolium, 188
Lemoine, 190
Lemon Lily, 211
Leopard's-bane, 208
Lespedeza Sieboldii, 214
Lethelin jelly, 315
Leubuscher, Frederic H., 300
Leucojum aestivum, 257
Leucothoë, 46, 285
Leucothoë Catesbaei, 285
Liatris, 214
Liatris pycnostachya, 214
Lighten: Said of soil when adding substance, such as sand, to reduce clay proportion.
Ligustrum amurense, 149
Lilac, 150, 151, 162
  Chinese, 146
  French hybrid, 162
  tree, 165
Lilies (*Lilium*), 125, 260
  culture of, 260-263
  list of especially beautiful, 264, 265
Lily (not *Lilium*),
  Blackberry, 204
  Day-, 135, 211
  Lemon, 211
  Plantain, 125
  St. Bernard's, 202
  Trout, 256, 266
  Water, 296
Lily-of-the-Valley, 206
Lime, benefits of, 89, 92
  danger of, 90
  hydrated, 90
  quantity to apply, 90
Limestone, ground, 90, 99
Lime-sulphur, 314

Linaria, 183
Linnaeus, 188
Linum, 214
Linum perenne, 183, 214
Liquidambar Styraciflua, 56
Liriodendron Tulipfera, 55
  Tulipfera var. *pyramidale,* 55
Lithospermum, 214
Lithospermum prostratum var. Heavenly Blue, 215
Loam, good garden, 77, 78
  natural, 77
Lobelia, 241
Lobelia cardinalis, 216
Locust, Black, 57
  Honey, 57
Lombardy Poplar, 50
Lonicera, 160
Lonicera fragrantissima, 160
  Morrowii, 160
  syringantha var. *Wolfii,* 160
Loosestrife, purple, 215
Love Plant, 205
Lupine, 215
Lupines, Russell, 215
Lupinus, 215
Lupinus polyphyllus, 215
Lythrum Salicaria, 215
  Salicaria var. *roseum superbum,* 215

Madonna Lily, 335
Magazines and books, 316-318
Magnesium, 75
Magnolia, 125, 160, 165
Magnolia denudata, 160
  Fraseri, 160
  glauca, 160
  grandiflora, 160, 272
  Soulangeana, 160
  stellata, 160
Mahonia, 286
Mahonia Aquifolium, 286
  repens, 286
Maiden-hair tree, 56
Maintenance, average cost of garden, 18
  specific cost of garden, 19
  time spent in, 19
Mallow, Greek, 221
  Rose, 221
Malus (Flowering Crabapple), 160
Manure: Any substance, particularly an animal product, worked into soil to increase its fertility.
Maple, Japanese, 152
  Norway, 49
  Soft, 50
Marigold, 242
  Harmony, 186
Masonry background, 144
Mass: Solidarity; strength in total effect.
McFarland, J. Horace, 318
McIntosh Red (Apple), 61, 62
Meadow Saffron, 256
Melia Azedarach, 52
Mellow: Said of soil in perfect working condition.
Merck & Co., 185
Mertensia virginica, 215
Michaelmas Daisy, 197
Milkweed, 203
Mission Bells, 256
Mistflower, 209
Mock Orange, 151, 161
  var. Virginal, 161, 165
Monarda didyma, 216
  didyma, Perry's Variety, 216
Monkshood, 200
Monotony, overcoming hedge, 164, 165

Monuments, trees honored by, 62
Morse, Mrs. H. K., 283
Morton Arboretum, 57
Mosquitoes in pools, control of, 296
Moss, prevalence of, 91
Moss Pink, 125, 197
Mountain Andromeda, 286
  Ash, 164
  Laurel, 277, 281, 283
  Lover, 122
Mulberry, 164
Mulch: Light, loose covering about roots to conserve moisture and protect plants.
Mulch, winter, 312, 326
Mullein, 222
Muscari, 266
Mushroom soil, uses of, 99, 100, 296
  price of, 100
Myrica carolinensis, 161
  cerifera, 161
Myrtle, classic, 188
  Crape, 188
  Sand, 188
  Trailing, 122, 126, 188
  Wax, 161
Myrtus communis, 188

Named varieties, meaning of, 186, 187
Names, botanical, explanation of, 188-191
Narcissus, 62, 123, 124, 244, 266, 281
  classification of, 246, 247
  culture of, 251, 252
  Paper-white, 323
  selection of varieties under principal types of, 248-251
Narcissus Bulbocodium var. *conspicua,* 251
  Jonquilla, 246
  Pseudo-Narcissus, 246
Nasturtium, 242
Naturalize: To cause to grow without cultivation.
Nepeta Mussini, 167, 216
  var. Six Hills Giant, 216
  var. Souvenir d'André Chaudron, 135
Neutral soil: Soil testing out to pH 7.0.
New York World's Fair, 239
Nichols, Beverley, 318
Nicotiana, 242
Nicotiana sylvestris, 241
Nicotine sulphate, 314
Nitrogen, 75
Norway Maple, 49
Nursery row: Commercial planting in a line; actual planting of the row is usually called lining-out.
Nursery stock: Plants grown chiefly by professionals for sale.
Nymphaea (Water lilies), 296
Nyssa sylvatica, 164

"Oak Hill," 227
Oak trees, 54
  Black, 54
  Pin, 54
  Red, 54
  the Wye, 54
Odor, control of compost, 99
Oenothera, 216
Oenothera fruticosa var. *Youngii,* 216
Oleaster, 157

Olmsted, Senior, Frederick Law, 12, 41
O. M. Scott & Sons, 107, 114
Open Letter to a Friend, 1
Order, emphasis upon, 10
Organic: Produced by vital processes.
Ornithogalum umbellatum, 257
Ortloff, H. Stuart, 168
Osmanthus, Holly, 286
Osmanthus Aquifolium, 286
Oswego Tea, 216
Outdoor Living Room, Chapter on the, 39
Outdoor living room, 44

Pachistima Canbyi, 122
Pachysandra, 126
Pachysandra terminalis, 122
Paeonia, 194
Paeonia suffruticosa (*Moutan*), 195
  suffruticosa var. *Banksii,* 195
Painted Daisy, 198
Panicle: A branching flower cluster.
Pansy, 135, 223
  Roggli's Cardinal Shades, 223
Papaver nudicaule, 216
  nudicaule var. *Schinzianum,* 217
  orientale, 217
  orientale var. Fairy, 217
  orientale var. Mrs. Perry, 217
Paper, graph, 29, 137
Pardanthus, 204
Parterre: A system of flower beds arranged in a design.
Parthenocissus quinquefolia, 164
Paulownia tree, 52
Paulownia tomentosa, 52
Pea, Sweet, 325
Peaches, dormant spray for, 323
Peat: Type of soil formed by partial decay of marsh and aquatic plants.
Peat moss: Commercially available sphagnum moss in partially decayed state. Valuable in many ways, especially in increasing soil's ability to hold moisture and in improving texture.
Pentstemon, 217
Pentstemon barbatus var. Pink Beauty, 217
  heterophyllus, 217
Peony, 135, 194
  herbaceous, 194
  list of outstanding species and varieties of, 194-196
  tree (shrubby), 165, 194
Pepperidge, 164
Perennial: Of three or more seasons' duration.
Perennials, Chapter on, 175
  detailed list of five main hardy, 191-199
  detailed list of additional good hardy, 200-224
  from cuttings, how to grow, 183-186
  from seed, how to grow, 181, 182
  how to divide, 179, 180
  how to recognize need for division of, 177, 178
  list of seed-grown, 182, 183
  satisfying edging, 167
  soil preparation for, 89, 95
  what we mean by, 175, 176
  when to divide, 178, 179
Perianth: The whole floral envelope.

Periwinkle, 122
Perovskia atriplicifolia, 217
Persistent: Remaining attached, as leaves of trees which hang on most of the winter.
Personality, reflection of owner's, 40, 64
Petunia, 241, 242
Petunia, double, 232
pH scale, 91
Philadelphus, 161
Philadelphus coronarius, 161
  Lemoinei, 190
  Lemoinei var. Avalanche, Hort., 190
  splendens, 161
  var. Virginal, 161
Phlox, hardy, 135, 196
  list of outstanding varieties and species of, 196, 197
  species of, 196, 197
  varieties for ground cover of creeping, 125
Phlox divaricata, 62, 124, 196, 266
  paniculata, 196
  subulata, 124, 197
Phosphorus, 75
Photinia villosa, 161
Physalis Franchetii, 218
Physostegia, 218
  var. Vivid, 218
Picea, 275
Picket fence, 145
Pieris (Andromeda), 286
Pieris floribunda, 286
  japonica, 286
Pin Oak, 54
Pinch out (or back): Removal of part of terminal shoot, especially of seedlings, to compensate for root injury in transplanting and to induce stocky growth.
Pine, 276, 279
  Mugho, 165, 278
  White, 52
Pinks, 207
  Cottage, 177
Pinus montana var. *Mughus,* 165
Pinxter Flower, 154
Pip: Small upright root-stock, as of lily-of-the-valley.
Pistillate: Having pistils and no stamens.
Plain Dirt Gardener, the, 317
Plan, garden, 16, 37; *illus.,* 30-33
Planning, Chapter on Garden, 5
  professional methods of, 16
  steps in small place, 27-37
Plant detail, errors in, 65
Plant food: In general, commercial fertilizer; of little value unless soil is in sound physical condition and contains plenty of humus.
Plant growth, chemicals needed for, 75
  mechanical soil condition needed for, 75, 76
Plant material, overcoming limited acquaintance with, 14, 15
Plants, pH preferences of, 91, 92, 282
Plantain Lily, 125
Planting season, factors modifying, 319, 320
Platycodon, 183, 218
Platycodon grandiflorum, 218
  grandiflorum var. *album,* 218
  grandiflorum var. *Mariesii,* 218
Plum, Beach, 162

Plumbago larpentae, 123, 205
Poa (Bluegrass), 104, 107
Poa pratensis, 104
  trivialis, 118, 121
Polemonium, 219
Polemonium reptans, 219
  Richardsonii var. *caeruleum,* 219
Polianthes tuberosa, 257
Pollination: Transfer of pollen from the anther to the stigma. In other words, fertilization in the flower results and seeds follow.
Polyanthus (*Primula Polyantha*), 183, 219
Polygonum Aubertii, 225, 323
Pools and Rock Work, Chapter on, 289
  danger of incongruity in, 290
Pools, selection of right types of, 293
  construction of, 294
  management of, 294-296
  usual cost of, 298
  winter care of, 299, 300
Poplar, Carolina, 50
  Lombardy, 50
  Tulip, 55
  Yellow, 55
Poppy, Iceland, 216
  Oriental, 217
Populus deltoides, 50
  nigra var. *italica,* 50
Portulaca grandiflora, 303
Potash, 75
Potsherds: Broken flower pots.
Prick out: To separate small seedlings, an operation frequently performed with the aid of a sharp stick, while making ready to transplant them more generously spaced into flats.
Principles of Agriculture, 82
Primrose, hardy, 219
  Bunch, 219, 266
Primula, 62, 124, 219
Primula Polyantha, 178, 219
  Polyantha, Munstead Strain, 219
Private or Garden Area, 36
Privet, 149
  Regel's, 331
Propagation and Trial Area, 34
Proportion, importance of border and background, 145
Protection, winter, 311, 312
Pruning, fundamentals of, 276
Prunus, 161
Prunus maritima, 162
Pseudotsuga, 277
Purple Coneflower, 220
Purple Loosestrife, 215
Pyracantha coccinea var. *Lalandii,* 281
Pyramidal: Tapering to a point.
Pyrethrum, 183, 198
Pyrethrum (insecticide), 314
Pyrus Malus, 160

Quamash, Indian, 267
Quercus nigra, 54
  palustris, 54
  rubra, 54
Quince, Japanese, 146, 150, 155

Raceme: Elongated indeterminate flower cluster, as in wisteria.

Raffia: A fiber, much used in tying plants, made from the leaves of a Madagascar palm.
Ramsey, L. W., 27, 298
Raymore, Henry B., 168
Real Gardening, 316
Red Arrow, 315
Red Cedar, 148, 164
Red Oak, 54
Red Osier, 156
Redbud, 155
Red-hot Poker, 213
Redvein Enkianthus, 157
Regal Lily, 269
Remodeling, garden, 10, 15
Reniform: Kidney-shaped.
Retinospora, 148
Rhamnus Frangula, 150
Rhizome: Root-stock or underground stem.
Rhododendron, 46, 282, 284
Rhododendron arborescens, 154
  calendulaceum, 154
  carolinianum, 284
  catawbiense, 284
  japonicum, 153
  maximum, 284
  nudiflorum, 154
  sinense, 153
  Vaseyi, 154
  viscosum, 154
Rhus Cotinus, 156. See *Cotinus Coggygria.*
Rich, Howard R., 204
Robinia Pseudacacia, 57
Robinson, William, 41, 44
Rock gardens, special training and opportunity needed for, 300, 301
Rock Spray, 285
Rock work and pools, Chapter on, 289
  danger of incongruity in, 290
Rock work, dry wall not difficult, 301, 302
  pocket planting is useful, 302, 303
Rockefeller Center, 79, 239
Rocket, Sweet, 211
Rockwell, F. F., 317
Root-hardy: Tops winter-kill but roots live over.
Rosa Hugonis, 125
Rose, original Tea, 191
  Radiance, 191
Roses, 219
  climbing, 225
  dormant, 325
  Horvath hybrid, 220
  shrub, 165
  wild, 164
Rose Mallow, 221
Rose of Sharon, 323
Rosebay, 284
Rose-chafers: Rose bugs.
Rotenone, 314
Rough-stalked Meadow Grass, 121
Royal Horticultural Society, 246
Rudbeckia, 220
Rudbeckia hirta, 220
  speciosa (Newmanii), 220
Russian Olive, 157
Russian Sage, 217

Sagebrush, 202
St. Bernard's Lily, 202
Salisbury, Professor E. J., 318
Salix, 50, 51
Salix babylonica var. *Salamonii*, 51
Salvia, blue, 220

Salvia azurea var. *Pitcherii,* 220
  farinacea, 220
  patens, 220, 241
  splendens, 242
Sandy soil, add to, 86
Scabiosa caucasica, 221
Scale: Balance, proportion.
Scale insects, 313
Scape: Leafless stem.
Schizophragma hydrangeoides, 225
Scilla hispanica, 256
  nutans, 281
  sibirica, 257
Scotch Broom, 156
Scott's Lawn Master, 109
  Turf Builder, 114
Scutellaria baicalensis, 221
  baicalensis var. *coelestina,* 221
Sea Holly, 209
Sea Pink, 202
Seed bed: Ground made fine and otherwise prepared in order to favor germination of seeds.
Seedling: A young plant grown from seed; not a rooted cutting.
Self-pollination: Transfer of pollen from stamen to pistil of same flower.
Self-sow: Said of plants which readily establish themselves by seeding.
Senna, Wild, 205
Service Area, 35, 36
Seymour, E. L. D., 2
Shadbush, 153
Shade, practical value of, 47
  flowers in, 62; also consult list, 200-224
Shade—(*Continued*)
  grass or ground cover in, 121
  influence upon garden design of, 46
  list of desirable trees for, 52
  plants for acid soil and, 272 *et seq.*
  special garden opportunity in, 283
  under-drainage in, 86
Shapes, garden, 25, 26
Sheep Laurel, 284
Shift: To transplant, especially to transplant potted plants from pots of one size to pots one size larger.
Shrub: A low-branching woody plant, in general smaller than a tree.
Shrubbery, definite form in, 151
  root control of, 151
Shrubs and flowering trees, list of deciduous, 152-164
Siberian Elm, 53
Sidalcea malvaeflora, 221
  malvaeflora var. Rosy Gem, 221
Silverbell, 158
Silver-lace Vine, 225, 226
Simplex test kit, 94
Site, fundamental limitations of, 21
Skullcap, 221
Slip: A soft-wooded cutting. The name comes from the former practice of pulling or "slipping" off a part of the plant to be propagated.
Smoke Tree, 156
Snapdragon, 135
  rust-resistant, 242
Snarol, 315

Sneezeweed, 211
Snowball, 163
  Japanese, 163
Snowdrop, 266
Snowflake, Summer, 257
Soft Maple, 50
Soil, Chapter on Garden, 70
  acid, 91
  alkaline, 91
  atmosphere of, 74, 75
  clay, 86, 96
  demands made upon garden, 76
  grains of, 74
  how to take a sample of lawn, 107
  lime, stable manure and other conditioning products for, 89
  maintenance of fertility in, 81, 82, 94-97
  microscopic life in, 74
  organic matter in, 74
  sandy, 86
  short rules for improving, 78, 79
  solution in, 74
  what is, 73
  when to work, 94
Soil preparation, reasons for, 72, 73
Soil test: Chemical test to determine lack of essential elements or degree of acidity (pH reading) in a soil.
Soil test, determining chemical deficiency by, 93, 94
  determining degree of acidity or alkalinity by, 91, 92
Soil testing sets, 90
Southernwood, 202, 203
Space, main allocations of, 29
Species: A class, or individual, recognizably differentiated from other members of the same genus; a division of a genus.
Species Plantarum, 188
Specimen: An individual plant; in landscaping, a plant exhibited by itself rather than as one of a group; an accenting plant.
Speedwell, 222
Spicebush, 154
Spiderwort, 222
Spingarn, Joel E., 13
Spiraea (Astilbe), 203
Spirea, 150
  Van Houtte's, 152
Spraying. See Insects and Diseases, 312
Spruce (*Picea*), 275
Spruce, blue, 67
Spur: Tubular projection from a blossom; also a lateral shoot trimmed back short, thus resembling a spur.
Spurge, Japanese, 122, 281
Squill, Siberian, 257
Stachys officinalis, 221
  Betonica grandiflora, 221
Staminate: Having stamens and no pistils. The stamen is the pollen-bearing organ.
Standard Cyclopedia of Horticulture, The, 2, 317, 341
Star Magnolia, 160
Stars of Bethlehem, 256
Starwort, 197
Steichen, Edward, 13, 206

Sterile: Applied to flower, without pistils; to soil, infertile.
Steriloam, 181
Stolon: A horizontal shoot which touches the ground and takes root.
Stool: A clump of roots; loosely, to spread from the crown.
Stout, Dr. A. B., 211
Strike: Said of a cutting when it forms roots.
Style, Chapter on Outdoor Living Room and its garden, 39
  plant material contributes to, 63, 64, 65
  success in choice of garden, 39, 40
Sub-: Prefix, usually meaning "somewhat like," as subshrub.
Subsoil, explanation of, 83
Successful gardening, five attributes of, 17
Sucker: Shoot arising from, or close to, the root.
Sucking insects, 313
Sugarberry, 54
Sumac, 164
Summary of Chapter I on Garden Planning, 37, 38
  of Chapter II on style of Outdoor Living Room, 68, 69
  of Chapter III on Garden Soil, 101, 102
  of Chapter IV on Lawns and ground covers, 127, 128
  of Chapter V on the Mixed Flower Border, 173, 174
  of Chapter VI on Perennials, 228, 229
Summary—(*Continued*)
  of Chapter VII on Annuals, 242, 243
  of Chapter VIII on Bulbs, 269, 270
  of Chapter IX on Evergreens, 287, 288
  of Chapter X on Pools and Rock Work, 303, 304
Summer Lilac, 154
Summersweet, 155
Sundrops, 216
  Young's, 216
Sun Rose, 124
Sun-scald: Browning of evergreen foliage resulting from a combination of sun and frost; also used as a synonym for fire-blight, though infrequently.
Superphosphate, 86
Survey, preliminary landscape, 28, 29
Swampbay (Sweetbay), 160
Sweet Alyssum, 241
Sweet Gum, 56
Sweet Pea, 325
Sweet Pepperbush, 155
Sweet Rocket, 211
Sweet William, 207
Sweetshrub, 151, 154, 165
Symphoricarpos orbiculatus (vulgaris), 164
Syringa, 162
Syringa chinensis, 162
  persica, 162
  vulgaris, 162

Tamarisk, 162
Tamarix parviflora (africana), 162

Tamp: To compact soil by a series of blows, usually with a heavy stick or a special tool, a tamper.
Taproot: A strong perpendicular main root.
Taste, bad, 12
Taxus baccata var. *repandens,* 281
  cuspidata, 147
  cuspidata var. *nana,* 147
  media Hicksi, 147
Taylor, Norman, 2
Termination, axial, 24
Terminals: Leading shoots.
Termini: Boundary markers; upper part often in form of human.
Terrace, eastern, 47
  northern, 46
  southern, 47
  western, 47
Teucrium Chamaedrys, 166
Thalictrum, 221
Thalictrum aquilegifolium, 221
The English Flower Garden, 41
The Flower Grower, 317
The Garden Encyclopedia, 2
The Living Garden, 318
The World Was My Garden, 339
Theme, a central garden, 64, 65
Thin out: To remove specimens from a planting in order to permit those remaining to grow without crowding.
Thistle, Globe, 208
Thrift, 202
Thuja, 148
Tillage: General name for working or stirring the land.
Tiller out: To spread from the bottom; to stool.
Tomentose: Densely woolly.
Tools and accessories, list of, 307-311
Top-dressing: Surface enrichment of soil.
Topiary work: Clipping of trees and shrubs into formal, sometimes fantastic, shapes.
Topography: Surface features; conformation.
Topography, influence of, 21
Topsoil, explanation of, 83
  purchase of, 84, 85
Torenia Fournieri, 241
Tradescantia, 222
Tradescantia fluminensis, 222
  virginiana, 222
  var. James C. Weguelin, 222
Tradition, American garden, 40-44
Transpiration: Escape of water in the form of vapor from leaves and other parts of a plant.
Traps, beetle, 315
Trees, shade, 48
  balance and perspective gained by, 48
  list of high-garden-rated, 52-59
  list of low-garden-rated, 49-52
  smaller secondary, 59
  establishment of garden tone by, 63
  space allowance for, 49
Trenching, 86-89. See Double-digging.
Trial and Propagation Area, 34
Tricker, William, 296
Triogen, 207, 315
Tritoma, 171, 213
Trout Lily, 256, 266

Trumpet Flower, 213
Tsuga canadensis, 148
Tuber: A short congested part of a root-stock.
Tuberose, 257
Tulipa acuminata, 255
  biflora, 255
  Clusiana, 255
  Kaufmanniana, 255
Tulips, 253, 254, 255, 268, 269
  Breeder, 268
  Botanical, 255
  Candy-Stick, 255
  Cottage, 268
  Darwin, 268
  short color list of reliable, 255
  Water-Lily, 255
Tulip Poplar, 55
Tulip tree, 55
Tupelo, 164
Turgid: Swollen with sap.
Type, the: Representative species, as "this variety is larger than the type."

Ulmus, americana, 52
  parvifolia, 53
  pumila, 53
Umbel: Flower cluster shaped approximately like an umbrella.
Under-drainage: Use of drains or porous material in planted areas to draw off standing water, lower the water table, cause deep rooting, promote aeration of the soil and increase the vigor of plants.
Underplanting: Planting beneath.
Unity, structural, 290
  example of loss of structural, 291-293
  visual house and garden, 23

Vaccinium, var. Jersey, 165
Valerian, 222
  Greek, 219
Valeriana officinalis, 222
Variety: A race or strain within a species; a modification not specifically distinctive; a division of a species.
Verbascum, 222
  var. Cotswold Gem, 222
Verbena, 324
Veronica, 135, 183, 222
Veronica incana, 167
  longifolia var. *subsessilis,* 223
  spicata var. Blue Spires, 223
  Teucrium var. Heavenly Blue, 167
Viburnum, 163
Viburnum acerifolium, 163
  Burkwoodi, 163
  Carlesii, 163
  dentatum, 163
  Opulus var. *sterile,* 163
  prunifolium, 163
  Sieboldii, 163
  tomentosum, 163
  tomentosum var. *plenum,* 163
Vigoro, 75
Vigoro Spreader, 109
Vinca minor, 122, 188, 281
  Bowles Variety, 123
Vines, importance of, 224
  worthy types of, 224, 225
Vineyard Gazette, 70
Viola, 223
  var. Sutton's Apricot, 223

Viola cornuta, 223
  odorata, 167, 223
  odorata semperflorens, 124
  tricolor, 223
Violet, 124, 167, 223, 266
  Rohrsbach's Perpetual, 124, 223
Virgilia, 60
Virginia Bluebells, 123, 215
Virginia Creeper, 164
Vista: View through trees; a framed view.
Visual unity, 23
Vitex Agnus-castus, 223
Vitis, 164

Wandering-Jew, 222
Wardian case: An almost airtight, glass case used for transporting plants on long sea voyages, invented in 1836 by N. B. Ward.
Water lilies, culture of, 296-298
  list of meritorious varieties of, 299
  types of, 297
Water table: The plane of soil saturation under natural conditions.
Watering, avoiding mildew in, 101
  lawn, 117
  measured, 100
Wattle fence, 146
Wax Myrtle, 161
Wayman, Robert, 193
Wayside Gardens, 16, 196, 197
Weeds, lawn, 108, 109, 110, 120
  border, 95
White Pine, 52
White Swamp Honeysuckle, 154
Whole picture, importance of, 13
Wild Senna, 205
Wild Sweet William (Wild Phlox), 124, 196
Wilder, Louise Beebe, 318
Willow (*Salix*), 50, 51
Windflower, Japanese, 201
Winter Protection, principles of, 311, 312
Winter-kill: To die from seasonal cause.
Wisteria, 47, 165, 225, 227, 228
Witch Hazel, 158
"Witches' broom" disease, 54
Wood ashes, lime in, 92
Wood Hyacinth, 62, 256, 266
Wooden background, 145
Wright, Richardson, 317
Wye Oak, the, 54

Yellow Poplar, 55
Yellow-wood, 61
Yew, 46, 147, 149, 165, 166, 278, 281
  English, 281
  Hicks's, 147, 281
  Japanese, 147, 275
  Kelsey's, 147, 281
Yucca filamentosa, 165
Yulan Magnolia, 160

Zinnia, 238, 241, 242

ACC No........ 1199

ಡಾ॥ ಎಂ.ಹೆಚ್.ಮರೀಗೌಡ ರಾಷ್ಟ್ರೀಯ ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು - 560 004

ಪ.ಸಂಖ್ಯೆ: 1080 ವ.ಸಂಖ್ಯೆ:........................

ಗ್ರಂಥ ಹಿಂದಿರುಗಿಸುವ ದಿನಾಂಕ ಚೀಟಿ

ಈ ಕೆಳಗೆ ಕಾಣಿಸಿರುವ ದಿನದಂದು ಅಥವಾ ಅದಕ್ಕೂ ಮುಂಚೆ ಈ ಪುಸ್ತಕವನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು. ಅಥವಾ ಮುಂಚಿತವಾಗಿ ನವೀಕರಿಸಬೇಕು. ಇಲ್ಲದಿದ್ದರೆ ಒಂದು ದಿನಕ್ಕೆ ರೂ.1.00 ದಂಡ ಕೊಡಬೇಕಾಗುತ್ತದೆ.

ದಿನಾಂಕ..................ಸಹಿ	ದಿನಾಂಕ..................ಸಹಿ	ದಿನಾಂಕ..................ಸಹಿ

ಮು.ತಿ.ನೋ..

ಲಾಲ್ ಭಾಗ್, ಬೆಂಗಳೂರು

ವ. ಸಂಖ್ಯೆ ________________

____

ಪ. ಸಂಖ್ಯೆ 1080

ಲೇಖಕ (ಕಿ) Sterling Patterson.

ಶಿರೋನಾಮೆ Be your Own Gardener

ತೋಟಗಾರಿಕೆ ಇಲಾಖೆಯ
ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು-560 004